Regional Wet Weather Characterization Program Annual Monitoring Report Appendices for North Central Texas

- Year 2 -
(January 2019 – December 2019)

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Appendix A

Regional Wet Weather Characterization Plan Proposal for the Fourth Term Submission and Letter of Approval from TCEQ

Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Jon Niermann, *Commissioner*
Richard A. Hyde, P.E., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

June 30, 2017

Ms. Derica Peters, Senior Planner
North Central Texas Council of Governments (NCTCOG)
P.O. Box 5888
Arlington, Texas 76005-5888

Re: Approval of the North Central Texas Regional Wet Weather Characterization Plan Proposal for the Fourth Permit Term

Dear Ms. Peters:

The Texas Commission on Environmental Quality (TCEQ) received the final revised North Central Texas Regional Wet Weather Characterization Plan Proposal for the Fourth Permit Term (Proposal) on June 12, 2017, along with your response letter. The Proposal was originally submitted to TCEQ for review via electronic mail on October 11, 2016. TCEQ and EPA reviewed the Proposal and submitted comments to NCTCOG on March 7, 2017, and further discussed our comments with NCTCOG on a telephone conference on April 11, 2017.

We appreciate the opportunity to review the Proposal and appreciate NCTCOG' efforts to update the Proposal and provide responses to EPA's and TCEQ's comments. All comments have been addressed and TCEQ approves this Proposal for the fourth permit term.

If you have any questions, you are most welcome to call me at (512) 239-4784 or Ms. Hanne Nielsen at (512) 239-6524.

Best regards,

Rebecca L. Villalba

Rebecca L. Villalba, Team Leader
Stormwater & Pretreatment Team (MC 148)
Water Quality Division

RLV/HN/fc

cc: Ms. Allison Henry, Environment and Development Planner
North Central Texas Council of Governments (NCTCOG), P.O. Box 5888
Arlington, Texas 76005-5888

P.O. Box 13087 • Austin, Texas 78711-3087 • 512-239-1000 • tceq.texas.gov

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

REQUEST FOR PROPOSAL

PROJECT TITLE:

PART A: Field Collection and Analysis of Storm Water Samples

PART B: Biomonitoring Sampling and Analysis

RFP #NCT-2011-15

DEPARTMENT: Environment and Development
616 Six Flags Drive, Centerpoint Two
Arlington, Texas 76011

Date Issued: January 28, 2011
Proposal Due Date: February 28, 2011

Acceptance Period: 60 days

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1.0 REQUEST FOR PROPOSAL

1.1 WHAT IS NCTCOG?

The North Central Texas Council of Governments (NCTCOG) is a regional planning agency that serves a 16-county area surrounding the Dallas/Fort Worth Metroplex. Its 240 local government members include cities, counties, independent school districts, and special districts. NCTCOG provides services to its member governments including transportation planning, dissemination of demographic information, assistance with information systems development, environmental studies, planning for community services needs, 9-1-1 planning, emergency preparedness coordination, federally funded employment and training programs, training local government officials and providing continuing education for area police officers.

The Department of Environment and Development assists local governments as they work together to solve regional issues such as solid waste, sustainable development and efficient use of water and other natural resources. To that end, it oversees the coordination and implementation of the state's solid waste program for the region, as well as promotes the principles of Development Excellence and carries out various strategic initiatives, including support for Vision North Texas, the CLIDE Awards Program, and many others. Designated as the Water Quality Planning Agency for the region, the department supports the successful Trinity River COMMON VISION Program and provides assistance with Texas Pollutant Discharge Elimination System (TPDES) permit compliance to local entities.

1.2 PROJECT DESCRIPTION

NCTCOG's Department of Environment & Development is issuing this Request for Proposals (RFP) for technical environmental consultant assistance with a regional storm water monitoring program (regional program) of member entities for compliance with Texas Commission on Environmental Quality (TCEQ) Municipal Separate Storm Sewer System (MS4) TPDES permits for municipal storm water discharges. The regional program is being conducted in cooperation with the cities of Dallas, Fort Worth, Arlington, Garland, Irving, Plano, and Mesquite, and the Texas Department of Transportation-Dallas District and North Texas Tollway Authority (NTTA).

This request for proposals is seeking consultant assistance, not professional services as defined by the Texas Government Code Chapter 2254.002 (Professional and Consulting Services). The services provided under any contract resulting from this RFP will include most if not all of the above-named entities. However, each entity has the option to participate in this contract, depending on the outcome of the selection and contract negotiation process. Consequently, the proposal will need to include unit costs for services and provisions for making adjustments to the sampling plan if one or more entities choose not to participate.

Agencies or parties responding to this RFP, herein referred to as the **Respondents**, should note that the RFP is being offered in two parts (Parts A and B) that are related, but should be responded to separately and may be awarded separately. Respondents to the RFP that wish to submit proposals on both parts are reminded to keep their cost pricing separate so that each part can be considered separately in comparison with other submittals. Requested supporting documents and information in Part B that are duplicative with Part A can be included by reference by those who are submitting for both parts.

1.2.A REGIONAL WET WEATHER CHARACTERIZATION PROGRAM

The Regional Wet Weather Characterization Program (RWWCP) amended January 2011 (Attachment A) has been approved by TCEQ for compliance with TPDES storm water permit requirements. The RWWCP includes a general approach with several variants so it is strongly recommended that the Respondent review this document for specifics. In general, there will be up to eight entities involved in the consultant contract. The City of Fort Worth plans to use their own staff to collect and analyze both the chemical and the biological samples. Most entities will need quarterly samples to be taken from up to three locations in a single watershed each year for four sequential years. There will be a total of 96 annual samples from participating entities (i.e. this excludes Fort Worth's samples), and thus 384 total samples for the permit term. Sampling is expected to begin on January 1, 2012 and will end, December 31st, 2015. Monitoring periods will be by calendar quarters: January 1 - March 31, April 1 - June 30, July 1 - September 30 and October 1 - December 31. See attached map for locations of watersheds.

1.2.B PART A: FIELD COLLECTION OF STORM WATER SAMPLES FOR CHEMICAL ANALYSIS

Under **Part A**'s contract, the Respondent will develop a revised regional sampling protocol based on the RWWCP and the prior permit term's regional monitoring protocol (available at http://www.nctcog.org/envir/SEEclean/stormwater/program-areas/monitoring/RFP/RFP_2011.asp) and seek its approval from NCTCOG and the participating entities. The Respondent is encouraged to conduct a thorough review of the regional monitoring protocol with respect to scientific viability and practicality while developing the Part A protocol. The Respondent shall provide sample collection of storm water for field and laboratory analyses in accordance with this revised protocol. The services will also include delivery of the storm water samples to a qualified laboratory as proposed by the Respondent and agreed to by the regional program participants. The Respondent will demonstrate the availability of staff having competency with testing procedures and reporting requirements and other resources necessary to perform the described sample collection for one or more storm events at multiple predetermined locations within the participating entities' jurisdictions.

Although the watersheds to be sampled have been identified by the participating entities, exact sampling locations will need to be determined by the Respondent in consultation with the contracting entities and NCTCOG. The proposal is expected to include an approach for selecting optimal site locations. Automated sampling equipment used in the prior permit term will be made available for use by the selected Respondent. The selected Respondent will be asked to assess the status of each piece of equipment and to determine what, if anything, is needed to bring the equipment up to a mutually agreed upon standard. Each entity will be responsible for providing equipment that is in good working order. Once the equipment is found acceptable by the selected Respondent, they will be asked to maintain the equipment in similar working condition throughout the term of the contract. Costs for such routine maintenance, including replacement parts as needed, can be included in the overall costs of the contract. Replacement of defective, damaged, or nonfunctional equipment as may be necessary due to adverse weather conditions, vandalism or normal use is not considered routine maintenance and will be the responsibility of the original owner.

The collection of these samples should generally follow the procedures of TCEQ's "*Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods*", RG 415; (TCEQ, 2008) as currently amended.

Sampling will be initiated during the first flush of a storm event based on the criteria identified in the Sampling Protocol. Each sampling event will include collection of a first-flush grab sample and a time-weighted composite (minimum of four aliquots) to be analyzed per station. The first-flush grab sample or samples will be analyzed for:

- bacteria (*E. coli* and total coliform),
- oil and grease (O&G), and
- pH.

The composite sample will be analyzed for:

- 5-day Biochemical Oxygen Demand (BOD_5),
- Chemical Oxygen Demand (COD),
- Total Suspended Solids (TSS),
- Total Dissolved Solids (TDS),
- Metals: Copper, Lead, Zinc, Chromium, Arsenic
- Dissolved and Total Phosphorus,
- Total Nitrogen, and
- Carbaryl

Each sample will be collected in sufficient volume for the selected analyses.

Field data to be collected will include, but not be limited to:

- general observations of site conditions and water quality,
- antecedent dry period,
- time of rainfall event,
- time of subsequent sample collections,
- air and water temperature,
- specific conductance and
- rainfall data specific to the watershed and preferably at or near the sampling station(s).

An estimation of rainfall runoff and stream flow will also be needed in order to calculate pollutant loading. Include methodology to be used for these estimations in the Sampling Protocol. Field data will be reported along with the laboratory analytical data. Some of the sampling stations are expected to be located in remote areas and collections often have to be made under adverse weather conditions.

1.2.C PART A: LABORATORY ANALYSIS OF STORM WATER SAMPLES

The Respondent will provide in the proposal a recommendation of one or more preferred laboratories to conduct the analytical portion of the monitoring program, and include laboratory costs for the analysis of the storm water samples in the overall proposal. Transfer of storm water samples to this laboratory will require using proper chain-of-custody procedures. Field and laboratory analyses are expected to meet minimum regulatory requirements of the Environmental Protection Agency (EPA) and the TCEQ for storm water sampling and analyses, including quality assurance requirements. All laboratory analyses shall be performed by laboratories that have the appropriate National Environmental Laboratory Accreditation Program (NELAP) certification(s) to perform the analyses required under this contract. In addition, the laboratory should have the capability to perform the analyses within the stated data quality objectives including selected method detection limits. All data should be validated per TCEQ requirements for surface water quality data collection criteria, and the data quality objectives (DQOs) established in the Sampling Protocol.

1.2.D PART B: BIOMONITORING SAMPLING AND ANALYSIS

As listed in the regional monitoring plan, some of the participants will be required by permit to perform biomonitoring sampling and analyses in some of their watersheds. Under **Part B**'s contract, the Respondent will be asked to collect these samples, compile the data, and prepare the necessary reports The collection of these samples should be in accordance with the Sampling Protocol based on TCEQ's "*Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods*", RG 415; (TCEQ, 2008) as currently amended, for physical and chemical data, and "*Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data*", RG 416 (TCEQ, 2007*) as currently amended*. These procedures include limited field and laboratory chemical sampling and analyses, benthic macroinvertebrate community characterization using rapid bioassessment protocols (RBP), and a physical stream habitat assessment.

Field sampling should include, at a minimum, the following parameters:
- Temperature (air and water)
- Dissolved Oxygen
- pH
- Specific Conductivity
- Turbidity
- Nitrates
- Phosphates
- Bacteria: *E.coli*

The Respondent will demonstrate the availability of staff and equipment, staff competency with field collection procedures and reporting requirements, and/or other resources necessary to perform the described sample collection at multiple predetermined locations within the participating entities' jurisdictions. The frequency of collection is listed in the regional monitoring plan. Section 2.0 of the RFP includes a link to this information. Although the watersheds to be sampled have been identified by the participating entities, exact sampling locations and appropriate reference sites will need to be determined by the Respondent in consultation with the contracting entities and NCTCOG. The proposal is expected to include an approach for selecting optimal site locations. The Respondent's proposal will need to demonstrate availability and access to a laboratory or location that will be used for sorting and final assessment of the biological samples.

1.2 E DELIVERABLES

In addition to meeting TPDES permit requirements, both the NCTCOG and participating entities will be using the deliverables from this contract to support and enhance local understanding of regional water quality conditions. As such, Respondents are asked to develop each deliverable considering the end-use of all deliverables with respect to conveying information on local and regional water quality conditions to the general public and to the respective participating governing entities (e.g. City Councils, Planning Commissions, etc).

All contract deliverables will be provided in electronic format, with one draft submittal made to obtain NCTCOG and participant's comments, corrections and concerns, and one final submittal that incorporates comments as provided. A memorandum identifying resolution of comments should be provided with each final deliverable. Deliverables under this contract are anticipated to be:

PART A – FIELD COLLECTION AND ANALYSIS OF STORM WATER SAMPLES:

- **Sampling and Analyses Plan and Protocols (SAPP)**: Provide a document that outlines appropriate protocols to be used, frequency, type and location of sampling, sample location documentation, and analytical laboratory methods, and data quality objectives (DQOs). Include a table summarizing sample holding times, laboratory methods to be used, and appropriate method detection limits. Include Geographic Information System (GIS)-based mapping that indicates sample locations by types, per watershed. Data validation methods and data quality assurance measures should also be outlined.
- **Annual Reports Summarizing Data (One for each Year's Sample Efforts):** Provide a general summary report that summarizes the methodology used for field and analytical efforts, and the results obtained for the watersheds sampled in that year. Provide GIS-based mapping that indicates sample locations, and analytical results per watershed sampled for each permit year report. Provide an estimate of annualized pollutant loading for the watersheds sampled, with an explanation of methodology used to perform this estimation.
- **Permit Term Summary Report (One Final Report Summarizing Sampling and Analyses for Permit Years 1 through 4):** Provide a Final Permit Term Summary Report that summarizes the methodology used for field and analytical efforts, and the collective regional results obtained for the watersheds sampled through this program. Provide GIS-based mapping that indicates sample locations, and analytical results per watershed sampled for each permit year report. Provide a trend analyses of water quality conditions identified through this permit term, with respect to available data collected during the previous term. Provide a general summary analysis of water quality with respect to the Texas Surface Water Quality Criteria as set forth in 30 TAC Section 307, as currently amended. Provide an estimate of pollutant loading across the region, with an explanation of methodology used to perform this estimation.
- **Electronic Data:** Provide an electronic data deliverable that is consistent with the TCEQ Data Reporting requirements, and that is compatible with the GIS format used by the NCTCOG GIS database.

PART B – BIOMONITORING SAMPLING AND ANALYSIS:

- **Sampling and Analyses Plan and Protocols (SAPP)**: Provide a document that outlines appropriate protocols to be used, frequency, type and location of sampling, sample location documentation, and laboratory methods. Include location(s) and rationale for reference sample locations. as well as analytical laboratory methods, and data quality objectives. Include a table summarizing sample holding times, laboratory methods used along with appropriate method detection limits. Include GIS-based mapping that indicates sample locations and types per watershed, and reference sample locations. Data validation methods and data quality assurance measures should also be outlined. Include sample matrices to be used to develop the habitat assessments in accordance with guidance for Rapid Bioassessment Protocols (RBP).

- **Annual Reports Summarizing Data (One for each Year's Sample Efforts):** Provide a general summary report that summarizes the methodology used for field and analytical efforts, and the results obtained for the watersheds sampled in that permit year. Include GIS-based mapping that indicates sample locations, and analytical results per watershed sampled for each permit year. Also include tabular and graphic indication of habitat conditions for each watershed sampled for each sample period, as developed using standard RBP methods. Provide a discussion of findings relative to observed habitat conditions. Provide a general summary analysis of water quality with respect to the Texas Surface Water Quality Criteria as set forth in 30 TAC Section 307, as currently amended. Provide a general discussion of any observed anomalies such as extended drought, 100-year flood, or other heavy precipitation periods that may affect the water quality, and associated pollutant loading.
- **Permit Term Summary Report (One Final Report Summarizing Sampling and Analyses for Permit Years 1 through 4):** Provide a general summary report that summarizes the methodology used for field and analytical efforts, and the collective regional results obtained for the watersheds sampled through this program. Provide GIS-based mapping that indicates sample locations, and analytical results per watershed sampled. Also include tabular and graphic indication of habitat conditions for each watershed sampled, for each sample period, as developed using standard RBP methods. Provide a discussion of findings relative to observed habitat conditions. Provide a trend analysis of habitat conditions identified through this permit term. Provide a general summary analysis of water quality with respect to the Texas Surface Water Quality Criteria as set forth in 30 TAC Section 307, as currently amended.
- **Electronic Data:** Provide an electronic data deliverable that is consistent with the TCEQ Data Reporting requirements, and that is compatible with the GIS format used by the NCTCOG GIS database.

Changes to the deliverables may be revised upon agreement by the NCTCOG and the participating entities.

1.3 GENERAL QUALIFICATION REQUIREMENTS

A. Respondents submitting a proposal will be required to comply with provision 5159(a) of "Vernon's Annotated Civil Statute of the State of Texas" with respect to the payment of prevailing wage rates.

B. Respondents shall be responsible for obtaining any necessary licenses and permits, and for complying with any applicable federal, state, and municipal laws, codes, rules and regulations in connection with the work required by this contract.

C. Respondents shall have a minimum of 2 years experience in field collection of storm water samples. Respondents shall include with their proposal package the identification of at least three past or current clients for efforts similar in nature to the requirements of this request.

D. NCTCOG reserves the right to accept or reject any and/or all proposals or to cancel this notice at any time.

E. A response to this Request for Proposal (RFP) does not commit NCTCOG to a contract, or to pay any costs incurred in the preparation of such response.

F. Unless the Respondent specifies in its proposal, the NCTCOG may award the contract for any items/services or group of items/services in the RFP and may increase or decrease the quantity specified.

G. NCTCOG reserves the right to hold and accept any proposal for a period of sixty (60) days after the response deadline.

H. NCTCOG reserves the right to negotiate the final terms of any and all contracts with the selected Respondents and such agreements negotiated as a result of this RFP may be re-negotiated and/or amended in order to successfully meet the needs of the agency and its members.

I. NCTCOG reserves the right to waive any defect in this procurement process or to make changes to this solicitation as it deems necessary. NCTCOG will provide notifications of such changes to all Respondents recorded in the official record (Distribution Log/Receipts Record) as having received or requested an RFP.

J. NCTCOG reserves the right to contact any individual, agencies or employers listed in a proposal, to contact others who may have experience and/or knowledge of the Respondent's relevant performance and/or qualifications; and to request additional information from any and all Respondents.

K. NCTCOG reserves the right to conduct a review of records, systems, procedures, etc., of any entity selected for contracting. This may occur prior to, or subsequent to the award of a contract. Misrepresentation of the Respondent's ability to perform as stated in the proposal may result in cancellation of the contract.

L. NCTCOG reserves the right to withdraw or reduce the amount of a contract, or to cancel any contract resulting from this procurement if adequate funding is not available.

M. Respondents shall not, under penalty of law, offer or provide any gratuities, favors or anything of monetary value to any officer, member, employee or agent of NCTCOG or any of the participating member entities for the purpose of or having the effect of influencing favorable disposition toward their own proposal or any other proposal submitted hereunder.

N. No employee, officer or agent of NCTCOG or the participating member entities shall participate in the selection, award or administration of a contract if a conflict of interest, real or apparent, exists.

O. Respondents shall not engage in any activity that will restrict or eliminate competition. Violation of this provision may cause a Respondent's proposal to be rejected. This does not preclude joint ventures or subcontracts.

P. All proposals submitted must be an original work product of the Respondent. The copying, paragraphing or other use of substantial portions of the work product of others and submitted hereunder, as original work of the Respondent is not permitted. Failure to adhere to this instruction may cause the proposal(s) to be rejected.

Q. The only purpose of this RFP is to ensure uniform information in the selection of proposals and procurement of services. This RFP is not to be construed as a purchase agreement or contract, or as a commitment of any kind, nor does it commit the NCTCOG to pay for costs incurred prior to the execution of a formal contract unless such costs are specifically authorized in writing by NCTCOG.

R. The contents of a successful proposal may become a contractual obligation, if selected for award of a contract. Failure of the Respondent to accept this obligation may result in cancellation of the award. No plea of error or mistake shall be available to successful Respondent(s) as a basis for release of proposed services at stated price/cost. Any damages accruing to the NCTCOG as a result of the Respondent's failure to contract may be recovered from the Respondent.

S. A contract with the selected provider may be withheld at sole discretion if issues of contract compliance or questioned/disallowed costs exist, until such issues are satisfactorily resolved. Award of contract may be withdrawn by NCTCOG if resolution is not satisfactory to NCTCOG.

T. NCTCOG is the responsible authority for handling complaints or protests regarding the proposal selection process. This includes, but is not limited to, disputes, claims, protests of award, source evaluation or other matters of a contractual nature. Matters concerning violation of law shall be referred to such authority as may have proper jurisdiction.

U. Once the selection(s) of a Respondent(s) has been made, all Respondents to this RFP will be notified in writing of the results. Any protest regarding this process must be filed with NCTCOG in accordance with the following procedure. NCTCOG would like to have the opportunity to resolve any dispute prior to the filing of an official complaint by the protester. The protester should contact NCTCOG's Deputy Executive Director, at (817) 695-9121, P.O. Box 5888, Arlington, Texas 76005-5888, so that arrangements can be made for a conference between NCTCOG and the protester. Copies of the appeal process will be made available to the protester.

V. At all times during the term of a contract with NCTCOG, the contracted party shall procure, pay for and maintain, with approved insurance carriers, the minimum insurance requirements as required by law and shall require all subcontractors contractors performing work for which the same liabilities may apply under this contract to do likewise. The contractor may cause the insurance to be effected in whole or in part by the subcontractors under their contracts. NCTCOG reserves the right to waive or modify insurance requirements at its sole discretion.

W. Contractor covenants and agrees to indemnify and hold harmless and defend NCTCOG, its officers and employees, from and against any and all suits or claims for damages or injuries, including death, to persons or property, whether real or asserted, arising out of any negligent act or omission on the part of the contractor, its officers, agents, servants, employees, or subcontractors, and the contractor does hereby assume all liability for injuries, claims or suits for damages to persons, property, or whatever kind of character, whether real or asserted, occurring during or arising out of the performance of a contract as a result of any negligent act or omission on the part of the contractor, its officers, agents, servants, employees, or subcontractors to the extent permitted by law.

1.4 INTERPRETATION OF REQUEST FOR PROPOSAL DOCUMENTS

A written request for an interpretation of the Request for Proposal (RFP) may be made to the Department of Environment and Development, by either fax or mail or email, at any time up to seven (7) calendar days prior to the due date for the Proposals. The person submitting the request will be responsible for its prompt delivery. Upon receiving such a request, the NCTCOG will issue an interpretation of the Proposal Documents as a formal addendum to the RFP.

A Pre-Proposal Conference will be held on February 11, at 9:30 a.m. in the Tejas Room on the third floor of the NCTCOG offices at 600 Six Flags Dr., Arlington, Texas. At this time, Respondents may ask questions pertaining to the RFP but attendance at this meeting is not required. Responses to these questions will be recorded and included as an addendum to this RFP.

A copy of any addenda will be posted on the NCTCOG website at www.dfwstormwater.com. They can be faxed or emailed to interested parties upon request. All addenda must be submitted with the Respondent's Proposal. The NCTCOG will not be responsible for any other explanations or interpretations.

1.5 CONFLICTS & QUESTIONS

Should there be conflicts between the proposal documents and the final executed contract document; the final contract shall take precedence.

Questions regarding this Request for Proposal should be submitted in writing by 5:00 p.m. Wednesday, February 23 to:

Keith Kennedy
Manager of Environmental Programs
Department of Environment and Development
North Central Texas Council of Governments
616 Six Flags Drive, Centerpoint Two
Arlington, Texas 76011
kkennedy@nctcog.org

Responses to all questions will be submitted in writing to all potential respondents and posted on NCTCOG's website.

2.0 PROPOSAL SUBMITTAL

Before submitting a proposal, the Respondent is required to thoroughly examine the RFP documents and familiarize themselves with federal, state, and local laws and ordinances; and rules and regulations applicable to this requisition. Respondents should refer to Attachment A to review the details of the RWCCP. A copy of the regional monitoring protocol used for the prior Permit Term may also be obtained at: http://www.nctcog.org/envir/SEEclean/stormwater/program-areas/monitoring/RFP/RFP_2011.asp

Each Respondent should include all items necessary to complete the project(s) to which they are submitting in their proposal (Part A and/or Part B); otherwise the entire proposal may be considered non-responsive and rejected. See detailed instructions for Statement of Work in Section 3.3 of these proposal documents. In case of ambiguity or lack of clarity, the NCTCOG reserves the right to adopt the most advantageous construction thereof to the NCTCOG or to reject the proposal.

Additional proposal documents may be obtained at the NCTCOG Department of Environment and Development, 616 Six Flags Drive, Centerpoint II, Arlington, Texas upon request. A photocopying charge may be assessed. Copies of these documents and other relevant information can also be obtained directly from the NCTCOG website at www.dfwstormwater.com.

Proposals should be printed double-sided and must be submitted in a sealed envelope, addressed to and received at the reception desk of NCTCOG, 616 Six Flags Drive, Arlington, Texas **no later than 4:00 p.m. on February 28, 2011**. The name of the Respondent and the project title must be clearly marked on the envelope and the statement "**PROPOSAL DOCUMENTS ENCLOSED, DELIVER TO DEPARTMENT OF ENVIRONMENT AND DEVELOPMENT**" placed in the lower left-hand corner of the envelope in which the documents are delivered. If the documents are placed in an envelope that is contained inside another envelope, the statement shall be placed on the outermost envelope. Any proposal documents not properly marked or not received in the proper place by 4:00 p.m., February 28, 2011 will be considered non-responsive.

In addition to this hard copy of the proposal documents, an electronic copy of all documents for consideration must be submitted on compact disc (CD) in either MS Word or Adobe pdf format.

Proposals may be withdrawn at any time before award. Written proposals are withdrawn upon receipt by the NCTCOG Project Representative of a written notice of withdrawal.

NO FAXED, EMAILED OR LATE PROPOSALS WILL BE ACCEPTED

2.1 OPENING OF PROPOSALS

The name of all Respondents submitting proposals will be read aloud at the NCTCOG office at 4:05 p.m. on February 28 2011. The location of this reading will be posted on the NCTCOG electronic calendar and is open to anyone; however, attendance by Respondents is not required. The name of all Respondents submitting proposals will subsequently be posted on the NCTCOG website by March 1, 2011. Proposals shall be handled so as to avoid the disclosure of the remainder of their contents to competing Respondents and so as to keep such contents secret during negotiations. All proposals will be made available for public inspection after the contract is awarded, but trade secrets and confidential information in the proposals will not be open to public inspection. Respondents should specifically identify all proprietary materials when submitting proposals.

2.1.A PROPOSAL EVALUATION

This RFP for consultant assistance uses a qualifications-based procurement process which includes cost considerations. Proposals will be evaluated by a committee made up of members of the participating entities, facilitated by NCTCOG staff who are non-voting members of the committee. Selections for both Part A and Part B will be based on the completeness and quality of the proposal documents and weighted as shown for the following factors:

Recommended Approach and Thoroughness of Proposal	30
Number and Qualifications of Personnel Available for Task	20
Field Collection Experience and Past Performance	20
Total Cost	15
Ability to provide Services for both Part A and Part B	10
Historically Underutilized Business (HUB)	5

Each Respondent is responsible for submitting all relevant, factual, and correct information for evaluation of the above criteria with their proposal. Failure to provide information for any of these components will be considered grounds for rejection of the proposal. The Evaluation Committee will evaluate each proposal based on the information submitted. If additional information is submitted with the proposal, the Respondent must clearly make reference to it in the appropriate location in the proposal. The top-ranked Respondents will move on to the "Finalist Interviews". Finalists will be required to make a presentation to the Evaluation Committee on the date listed below. All Respondents will be notified of their proposal's status after the scoring has been completed.

NCTCOG reserves the right to award a contract to the Respondent(s) whose proposal is considered most advantageous (price and other factors considered) to NCTCOG and its members. More than one contract may be awarded from this request if necessary.

Any proposal submitted in accordance with this RFP shall remain valid for a period of 60 calendar days from the proposal due date.

2.1.B SCHEDULE OF EVENTS

EVENT	DATE
Issue RFP	January 28, 2011
Pre-Proposal Conference	February 11, 2011
Deadline for Submission of Proposals	**February 28, 2011**
Notification of Finalists	March 18, 2011
Finalists Interview	March 28, 2011
Expected Award of Contract	April 30, 2011
Expected Contract Start Date	October 1, 2011
Expected Contract End Date	June 30, 2016

2.1.C CONTRACT PERIOD/TYPE

The successful Respondent will be awarded a 57-month Cost Reimbursement Contract starting on or about October 1, 2011 and ending on June 30, 2016.

2.1.D NEGOTIATION OF THE CONTRACT

The NCTCOG will meet with the successful Respondent and negotiate a Contract based on the Proposal Documents. The NCTCOG is not obligated to accept any exceptions made by Respondent. After the negotiations, the NCTCOG will make final changes to the Contract documents and issue them along with a Notice of Awards to the successful Contractor(s).

2.1.E AWARD OF THE CONTRACT

The NCTCOG may conduct any investigations as deemed necessary to assist in the evaluation of any proposal and to establish the responsibility, qualifications, and financial capability of the Contractor, subcontractors, and other persons who are proposed to work on the project.

The NCTCOG will send a Notice of Award letter to the successful Contractor(s) with three (3) sets of contract documents. The successful Contractor(s) must execute the Contract in each set and return all three sets to the NCTCOG within the time period specified in the notice of award letter. Upon receipt of the three sets of contract documentation, the NCTCOG will execute each set and issue one set to the successful Contractor(s).

2.1.F RESERVATIONS

The NCTCOG reserves the right to reject any or all proposals and to waive any or all informalities.

2.1.G RIGHT TO TERMINATE

The NCTCOG will reserve the right to terminate the contract if the service provided by the contractor is unsatisfactory or does not meet expectations and the contractor, once notified of the dissatisfaction, has been unwilling to make changes in a reasonable amount of time.

3.0 PROPOSAL DOCUMENTS

3.1 PROPOSAL DOCUMENT CHECKLIST

All Proposal Documents, including this Checklist, must be completed in full and submitted in a sealed envelope, in the requested order, to be considered as a responsive submittal.

Proposal Documents	Initial if Included
PROPOSAL DOCUMENT CHECK LIST	_______
ACKNOWLEDGE REQUEST FOR PROPOSAL ADDENDA	_______
PROPOSAL SUMMARY WITH COST ESTIMATE	_______
STATEMENT OF WORK	_______
QUALIFICATIONS OF RESPONDENT	_______
LIST OF SUBCONTRACTORS	_______
INSURANCE CERTIFICATES	_______
RESPONDENT'S LEGAL & COMPLIANCE HISTORY	_______
RESPONDENT'S LICENSES & CERTIFICATES	_______
CERTIFICATIONS OF RESPONDENT	_______
HISTORICALLY UNDERUTILIZED BUSINESSES CERTIFICATION (IF APPLICABLE)	_______
ELECTRONIC COPY (CD) OF PROPOSAL DOCUMENTS	_______
ATTACHMENT A – PART A COST BREAKDOWN	_______
ATTACHMENT B – PART B COST BREAKDOWN	_______

I understand that all of these items are required for my submittal to be considered responsive.

RESPONDENT:

_____________________________ BY:_____________________________

Company Name (Print or type name of signatory)

_____________________________ _____________________________

Address (Signature)

_____________________________ _____________________________

City, State, Zip Title (print or type)

3.1.A ACKNOWLEDGEMENT OF RECEIPT OF REQUEST FOR PROPOSAL ADDENDA

Check if applicable ____

The undersigned acknowledges the receipt of the following addendum(s) to the Request for Proposals, and has attached all addenda following this page. (Add lines if necessary).

Addendum Number 1 ______________________
(Date received)

Addendum Number 2 ______________________
(Date received)

Addendum Number 3 ______________________
(Date received)

Check if applicable ____

The undersigned acknowledges the receipt of no addenda to the Request for Proposals.

RESPONDENT:

______________________ Company Name	BY: ______________________ (Print or type name of signatory)
______________________ Address	______________________ (Signature)
______________________ City, State, Zip	______________________ Title (print or type)

3.2 PROPOSAL SUMMARY WITH COST ESTIMATE

TO THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS:

The undersigned hereby proposes to furnish all labor, materials, supplies, superintendence, and any other items or services necessary to perform field collection, laboratory analyses and reporting services for the North Central Texas Council of Governments, which includes, but is not limited to, the collection of storm water samples and/or biological specimen collections as specified in these proposal documents.

The key personnel identified in this proposal are capable of performing sample collection services, either at this location or through subcontracts.

All Proposal Documents have been submitted in one sealed envelope.

____ Addenda to the Request for Proposal have been received.

Part A: The total cost estimate for all labor, equipment (excluding automated samplers), and materials, including laboratory analysis of the storm water samples is $________________. Unit prices are provided within the Proposal Documents.

Part B: The total cost estimate for all labor, equipment, and materials, including assessment of the biological samples is $________________. Unit prices are provided within the Proposal Documents.

This Proposal Summary and the accompanying Proposal Documents are intended to be complete and will remain valid for sixty (60) calendar days from the due date of the submittal.

RESPONDENT:

______________________________	BY: ______________________________
(Company Name)	(Print or type name of signatory)
______________________________	______________________________
(Address)	(Signature)
______________________________	______________________________
(City, State, Zip)	Title (Print or type)
______________________________	______________________________
(Phone)	(FAX)

____
(Email)

3.3 STATEMENT OF WORK

The items listed below shall be submitted with each proposal in the order shown. Each section should be clearly labeled. Failure of a Respondent to include all listed items may result in the rejection of the proposal.

I – Overview (1-3 pages)

State the underlying philosophy of your firm in providing the requested service and the overall approach you intend to take. Describe your understanding of the relevance of this project to the participating entities and to the North Central Texas area in general.

II – Plan of Approach (5-20 pages for each part)

For Part A, include:

- Description of proposed contract team, and the role to be played by each member. Include an organizational chart
- Detailed plan of approach (including major tasks and sub-tasks) for handling multiple and distant sampling locations for stochastic storm events under strict permit requirements.
- Types of equipment and methodology.
- Chain-of-custody procedures and other protocols
- Laboratory analysis arrangements
- Detailed timeline for getting sites ready to sample by January 1, 2012.
- Description of Deliverables

For Part B, include:

- Description of proposed contract team, and the role to be played by each member. Include an organizational chart
- Detailed plan of approach (including major tasks and sub-tasks) for handling multiple sampling locations, including reference sites.
- Types of equipment and methodology.
- Laboratory-type facility arrangements for assessment of biotic community assemblages
- Detailed timeline for getting sites ready to sample by January 1, 2012.
- Description of Deliverables

III – Costs to NCTCOG (2-5 pages for each part)

PART A – FIELD COLLECTION AND ANALYSIS OF STORM WATER SAMPLES: - Provide a detailed breakdown of costs for the requested services. A suggested categorization could include: initial site preparation; lab coordination; evaluation of existing equipment and recommendations for upgrading; storm sample collection (unit and overall costs); laboratory analysis; submittal of data to NCTCOG; routine maintenance and replacement of equipment, preparation of interim and final summary reports, etc. Please complete and provide Attachment B - Cost Breakdown for Part A.

PART B – BIOMONITORING SAMPLING AND ANALYSIS: - Provide a detailed breakdown of costs for the requested services. A suggested categorization could include: site identification; sample collection (unit and overall costs); sample assessment; submittal of data to NCTCOG; procurement and replacement of field equipment, preparation of interim and final summary reports, etc. Please complete and provide Attachment C - Cost Breakdown for Part B.

IV – Prior Experience, Capacity and References (No page limit)

Provide information that documents your firm's qualifications to perform the desired work, including its ability, capacity, skill, and financial strength. Include at least three (3) references of similar projects conducted in the past 5 years or less. Include a contact name, phone number and brief description of the project completed for each reference. If submitting HUB certification documentation, include it in Section 3.10.

3.4 QUALIFICATIONS OF THE RESPONDENT

The Respondent shall provide its company name, address, telephone number(s), and email addresses for the local office as well as the headquarters.

The Respondent shall attach a copy of its current Statement of Qualifications. If subcontractors are to be utilized for any services to be provided, a current Statement of Qualifications for those companies must also be included.

The Respondent shall submit a brief résumé (one page maximum, 10 pt type minimum) of each professional person (key personnel) who will be assigned to this contract. Identify key persons by name and title, longevity with firm, and describe the primary work assigned, as well as the estimated percentage of time that each person will devote to this contract.

3.5 LIST OF SUBCONTRACTORS

Respondents shall complete the following information and submit it with the Qualifications Documents to permit the NCTCOG to more fully evaluate the subcontractor's qualifications prior to awarding the contract.

Subcontractor's Name	Subcontractor's Address	Subcontractor's Telephone No.	Subcontractor's email address	Proposed Tasks on the Project

IF NECESSARY, PROVIDE MORE SHEETS TO DESCRIBE ADDITIONAL SUBCONTRACTORS.

3.6 INSURANCE CERTIFICATES

FOR PURPOSES OF THIS REQUEST FOR QUALIFICATIONS, PLEASE ATTACH A COPY OF YOUR CURRENT INSURANCE CERTIFICATE(S) BOUND WITHIN THE QUALIFICATIONS PACKAGE.

The successful Contractor will be required by the contract to have insurance coverage at least as stringent as detailed below. Within 30 days of the contract being fully executed, the Contractor shall deliver to the NCTCOG certificates documenting this coverage. The NCTCOG may elect to have the Contractor submit its entire policy for inspection.

A. Commercial General Liability Insurance - $1,000,000 each occurrence.

B. Professional Liability Insurance: (i.e. Asbestos Abatement Consultant Professional Liability Insurance or Industrial Hygienist Errors and Ommissions Liability Insurance) $1,000,000 each ocurrence.

C. Automobile Liability Insurance –
Coverage on vehicles involved in the work performed under this contract:
$500,000 per accident on a combined single limit basis
or:
$250,000 Bodily injury/person
$500,000 Bodily injury/accident
$100,000 Property damage

Uninsured/Underinsured Motorist –
$20,000 Bodily Injury each person,
$40,000 Bodily Injury each accident;
$15,000 Property Damage each accident.

D. Worker's Compensation –
Statutory limits for Worker's Compensation plus Employer's liability at a minimum:
$500,000 each accident;
$500,000 disease - policy limit; and
$500,000 disease - each employee.

E. The following shall pertain to all applicable policies of insurance listed above:

1. Each insurance policy required by this Contract, except for Workers Compensation insurance and professional liability insurance policies shall be endorsed to include the NCTCOG, its officers, agents, employees, representatives, and volunteers as additional insured in respect to operations and activities of, or on behalf of the named insured, performed under contract with the NCTCOG.

2. Subcontractors shall be covered under the Contractor's insurance policies or they shall provide their own insurance coverage; and, in the latter case, documentation of coverage shall be submitted to the Contractor prior to the commencement of work and the Contractor shall deliver such to the NCTCOG.

3. Prior to commencing work under the contract, the Contractor shall deliver to the NCTCOG insurance certificate(s) documenting the insurance required for performance under this contract, including the required terms and clauses.

4. Each insurance policy required by this contract shall contain the following clause or reasonably equivalent terms:

"This insurance shall not be canceled, limited in scope or coverage, or non-renewed unless a thirty (30) day prior written notice has been given to the Director of Environment and Development, NCTCOG, 616 Six Flags Drive, Centerpoint Two, Arlington, Texas 76011."

5. The insurers for all policies must be approved to do business in the State of Texas and be currently rated in terms of financial strength and solvency to the satisfaction of the Deputy Executive Director for the NCTCOG.

6. The deductible or Self-Insured Retention (SIR) affecting the required coverage must be deemed acceptable by the Deputy Executive Director for the NCTCOG; or, in lieu of traditional insurance, alternative coverage maintained through insurance pools or risk retention groups must also be approved by NCTCOG's Deputy Executive Director.

3.7 RESPONDENT'S LEGAL AND COMPLIANCE HISTORY

The Respondent's legal and compliance history is a critical component of this Request for Proposals. Read this section with due care and respond accordingly. Failure of the Respondent to provide all the information requested and to certify the report, will result in the Respondent's submittal being declared non-responsive.

The Respondent shall attach a written report of any legal action relating to the protection of the environment brought against the:

Respondent;
Respondent's officers;
Respondent's employees; AND
Respondent's proposed subcontractors

The report shall include all legal action brought within five (5) years of the closing date of this Request for Proposal. The report shall detail the substance, status, and outcome of such legal action. This includes, without limitation, the names of the agency and/or persons bringing the action, all relevant dates, and all fines, judgments, and/or settlements.

"LEGAL ACTION" means: ANY enforcement action by the United States Environmental Protection Agency, the Occupational Safety and Health Administration, any other federal agency, the Texas Commission on Environmental Quality (including its predecessor agencies the Texas Natural Resource Conservation Commission, the Texas Water Commission and the Texas Air Control Board), the Texas Department of Health, and any other state agency, commission or department, whether in Texas or elsewhere, as a result of violations, real or alleged, of any laws, licenses, permits, judicial orders, or administrative orders, relating to the protection of the environment. In this context, enforcement action shall include without limitation, written warnings, notices of violation, consent orders or agreements, compliance orders, administrative hearings, and criminal prosecution. Legal action also means any civil litigation brought by any person relating to the protection of the environment.

"RELATING TO THE PROTECTION OF THE ENVIRONMENT" means: requirements pertaining to the manufacture, processing, distribution, use, handling, storage, transportation, reporting, records keeping, permitting, licensing, treatment, disposal, emission, discharge, spill, release, or threatened release of hazardous materials, hazardous substances, hazardous wastes, toxic substances, petroleum, industrial waste, solid waste, pollutants or contaminants into or onto the air, surface water, drinking water, groundwater, storm water, publicly owned treatment works, or land.

THE REPORT SHALL BE SIGNED AND CERTIFIED by an authorized representative of the Respondent, using the form on the following page. **The top portion of the form is to be completed if a report is attached. The bottom portion of the form is to be completed if the Respondent has no legal actions to report.**

An authorized representative of the Respondent shall mean (1) if the Respondent is a corporation: the president, secretary, or treasurer, or a vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; (2) if the Respondent is a partnership, a general partner; and (3) if the Respondent is a sole proprietorship, the sole proprietor.
INCLUDE A COPY OF THE REPORT FOLLOWING THE CERTIFICATION PAGE BOUND WITHIN THE PROPOSAL PACKAGE

CERTIFICATION OF RESPONDENT'S LEGAL AND COMPLIANCE HISTORY

Complete ONE of the Following Certifications:

I certify under penalty of law that the attached report of Respondent's Legal and Compliance History was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

RESPONDENT:

______________________ BY:______________________
Company Name (print or type name of signatory)

______________________ ______________________
(Signature) Title (print or type)

____
Date

I certify under penalty of law that the legal and compliance history of Respondent, Officer's officers, Respondent's employees, and Respondent's proposed subcontractors was researched under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I hereby certify that no legal action relating to the protection of the environment was brought against Respondent, Respondent's officers, Respondent's employees, or Respondent's proposed subcontractors within the preceding five years. To the best of my knowledge and belief, this statement is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

RESPONDENT:

______________________ BY:______________________
Company Name (print or type name of signatory)

______________________ ______________________
(Signature) Title (print or type)

____
Date

3.8 RESPONDENT'S LICENSES & CERTIFICATES

The Respondent shall procure all permits and licenses, pay all charges, costs, fees, and give all notices necessary and incident to the due and lawful prosecution of the work included under this contract.

The Respondent must provide a copy of the appropriate certifications, registrations, licenses and related certificates (including subcontractors) with their submittal.

ATTACH COPIES OF CURRENT APPLICABLE LICENSES AND CERTIFICATES
BOUND WITHIN THE PROPOSAL PACKAGE

3.9 CERTIFICATIONS OF RESPONDENT

I hereby certify that the information contained in this proposal and any attachments is true and correct and may be viewed as an accurate representation of proposed services to be provided by this organization. I certify that no employee, board member, or agent of the North Central Texas Council of Governments has assisted in the preparation of this proposal. I acknowledge that I have read and understand the requirements and provisions of the Request for Proposal and that the organization will comply with all rules, regulations and other applicable local, state, and federal regulations and directives in the implementation of this program. I also certify that I have read and understood the contents of this Request for Proposals and will comply with the terms; and furthermore that I, ____ (typed or printed name) certify that I am the ________________________ (typed title) of the corporation, partnership, or sole proprietorship, or other eligible entity named as Respondent and Respondent herein and that I am legally authorized to sign this offer and to submit it to the North Central Texas Council of Governments, on behalf of said Respondent by authority of its governing body.

Equal Opportunity and Nondiscrimination

As a condition of the award, the Respondent assures that it will comply fully with the following nondiscrimination and equal opportunity provisions:

Title VI and VII of the Civil Rights Act of 1964, including the Nontraditional Employment Act for Women of 1991;
Section 504 of the Rehabilitation Act of 1973, as amended
The Age Discrimination Act of 1975, as amended;
All applicable regulations implementing those laws.

DRUG FREE WORKPLACE CERTIFICATION

The ____________________________________ (proposing organization) will provide a Drug Free Work Place in compliance with the Drug Free Work Place Act of 1988. The unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited on the premises of the ____________________________________ (proposing organization) or any of its facilities. Any employee who violates this prohibition will be subject to disciplinary action up to and including termination. All employees, as a condition of employment, will comply with this policy.

ATTEST TO Attachments of Certification

______________________________ _________________________________
Signatory Authority Signature   Collateral Signature

______________________________ _________________________________
Typed Name   Date

Subscribed and sworn to before me this _______day of ________________ (month), 2011 in

______________________(city), ____________(county), ___________(state).

________________________________ **SEAL**

Notary Public in and for ________________________(County),

State of _________________   Commission expires:_______________

3.10 HISTORICALLY UNDERUTILIZED BUSINESSES CERTIFICATION

Historically Underutilized Businesses (HUBs) are encouraged to participate in the RFP process. Representatives from HUB companies should identify themselves and submit a copy of their Certification.

NCTCOG recognizes the certifications of both the State of Texas HUB Program and the North Central Texas Regional Certification Agency. All companies seeking information concerning HUB certification are urged to contact.

State of Texas HUB Program
Texas Comptroller of Public Accounts
Post Office Box 13528, Capitol Station
Austin, Texas 78711-3528
(512) 463-5872

OR

North Central Texas
Regional Certification Agency
624 Six Flags Drive, #100
Arlington, TX 76011
(817) 640-0606

Proposer must include a copy of its HUB certification documentation as part of this RFP.

The North Central Texas Regional Wet Weather Characterization Plan Proposal for the Third Permit Term

I. History of the Regional Program

Since 1996, a regional storm water monitoring program has been on-going in the Dallas-Fort Worth (DFW) metropolitan area among the seven largest cities and major transportation agencies for compliance with Federal and State storm water permit requirements. During the initial permit term (1996 -2001), seven municipalities (Dallas, Fort Worth, Arlington, Irving, Garland, Plano and Mesquite) and two local districts of the Texas Department of Transportation (TxDOT) received joint approval from U.S. Environmental Protection Agency (EPA) for a regional monitoring program which utilized the assistance of a shared consultant team and the United States Geological Survey (USGS) to sample and analyze 22 outfalls primarily from small watersheds of a predominantly single land use type. Although these sample collections served to characterize typical urban runoff from these limited land use types, and were useful for estimating general pollutant loadings, they did little to evaluate impacts on actual receiving streams. In the next permit term, now administered by the Texas Commission on Environmental Quality (TCEQ), approval was obtained to utilize in-stream stations for the regional monitoring program to better assess this impact. The revised program was termed the Regional Wet Weather Characterization Program (RWWCP) and was added as an option in Part IV.A.3 of the Texas Pollutant Discharge Elimination System (TPDES) Municipal Separate Storm Sewer System (MS4) permits issued to the Phase I North Central Texas governmental entities. The primary goal of this new in-stream monitoring program was to obtain baseline data on receiving streams in the DFW Metroplex for use in determining long-term water quality trends. Since the RWWCP language existed outside of each permit, it allowed greater flexibility for making changes to the program. During this second permit term, the North Texas Tollway Authority (NTTA) joined the regional program. All other participants remained the same, except for the TxDOT-Fort Worth District who became a co-permittee with the cities of Fort Worth and Arlington and were no longer required to conduct wet weather monitoring. According to the original RWWCP protocol, municipal participants collected data from three sampling sites in the watershed (typically upstream, midstream and downstream) and the transportation agencies collected data from two sites (upstream and downstream stations only). Samples were collected quarterly from each site during a qualifying rain event and were analyzed for 18 parameters.

As an added component, the City of Fort Worth selected the Representative Rapid Bioassessment Monitoring Option (Part IV.A.2) in their permit, which allowed the chemical sampling frequency to be reduced from four times per year per site to once per year per site. In its place, two bioassessments were conducted each year at a minimum of nine sites. These bioassessments were based on protocols developed by the EPA. A summarization of this bioassessment data was included along with the chemical data in the annual regional monitoring report each year of the permit term.

II. Lessons Learned from the Most Recent Permit Term

At the end of the second permit term's sampling effort, a final summary monitoring report was prepared by the regional consultant, PBS&J, to assess the three-year sampling effort. The report found that in general, firm conclusions regarding the factors determining in-stream water quality could not be made due to the limited number of samples collected. Nevertheless, the report observed that all of the watersheds sampled had relatively consistent concentrations when compared to each other and that there was a general tendency of decreasing concentrations of parameters analyzed going from upstream to downstream. Constituent concentrations were found to be typically higher in warmer months as expected, but the length of antecedent dry period had surprisingly little influence on the in-stream water quality. Depending on parameter, the data was either higher or lower than national averages of storm water outfall data; however, it was generally higher overall relative to local ambient, dry weather data. This last finding is somewhat to be expected since storm events wash down the urban landscape and carry a higher load of pollutants than ambient conditions. As a result of these findings and a retrospective evaluation of the regional sampling program, PBS&J made the following recommendations for modifying the RWWCP in the next term:

<u>Increase the number of sampling events per site</u> - PBS&J suggested that either the frequency of monitoring during the year be increased or the same watershed be monitored for at least two years.

<u>Refine sampling site selection process</u> – This suggestion includes locating sites within impaired watersheds, focusing on impairment-causing pollutants, locating sites that foster long-term deployment, allowing for flow monitoring and minimizing vandalism.

<u>Conduct more RBAs in other jurisdictions</u> – Encourage more participating entities to include Rapid Bioassessments in the next permit term to gain a more thorough understanding of water quality impacts to urban receiving streams.

<u>Revise monitored pollutants</u> – The residential use of Diazinon was banned several years ago and has not been detected in any samples taken during this permit term. Therefore, PBS&J has recommended that Diazinon be replaced with Carbaryl, a commonly-used pesticide, for the next permit term. They also suggested that Cadmium be dropped from the parameter list since it was detected at very low levels and in less than 25 percent of the samples collected.

These recommendations were incorporated in this proposal for the next permit term.

III. Characterization of the Proposed Program

<u>Proposed Plan for Third Permit Term</u>

The primary goal of the monitoring program was to obtain baseline data on receiving streams in the DFW Metroplex for use in determining long-term water quality trends. This was generally achieved in the past permit term but final analysis indicated that more data is needed to establish actual trends. The Regional Storm Water Monitoring Partners of North Central Texas seek to continue documenting water quality improvements resulting from BMP effectiveness as they have over the past several years encompassing two permit terms. The regional partners would like to continue with the RWWCP because it has allowed for: 1) more coordinated and comprehensive water quality sampling; 2) more sound and reliable data collection; 3) greater cost effectiveness; and 4) a truer assessment of regional impact on stream water quality.

For this upcoming permit term, the Cities of Arlington, Dallas, Fort Worth, Garland, Irving, Mesquite and Plano, together with the North Texas Tollway Authority and TxDOT-Dallas District have agreed to continue their regional partnership to work cooperatively through the North Central Texas Council of Governments to develop a revised RWWCP. Permit numbers and relevant dates for each participant are included in Table 1.

TABLE 1: LIST OF PERMITTEES

PERMITTEE	TPDES PERMIT NUMBER	DATE ISSUED	EXPIRATION DATE
City of Arlington	WQ0004635000	5/26/2006	5/26/2011
City of Dallas	WQ0004396000	7/27/2007	2/22/2011
City of Fort Worth	WQ0004350000	2/22/2006	2/22/2011
City of Garland	WQ0004682000	12/22/2005	12/22/2010
City of Irving	WQ0004691000	5/26/2006	5/26/2011
City of Mesquite	WQ0004641000	5/26/2006	5/26/2011
City of Plano	WQ0004775000	7/20/2007	7/20/2012
North Texas Tollway Authority	WQ0004400000	2/22/2006	2/22/2011
Texas Department of Transportation-Dallas	WQ0004521000	6/30/2006	6/30/2011

The municipal regional partners have created a new sampling plan that will effectively monitor at least 50% of their jurisdictional area by the end of the permit term. This extent of jurisdictional coverage will allow a reasonable assessment of jurisdictional watersheds while striving to achieve a balance among the various goals of obtaining valid scientific information, meeting permit compliance, and addressing what is practicable for each entity. As in the previous term, this plan proposes to continue in-stream watershed monitoring, but seeks to obtain greater statistical robustness of the data by increasing the sampling period at each location to a minimum of two years. The primary goal of the RWWCP during this permit term will be to continue the assessment of urban impact on receiving stream water quality and to document any improvement presumably resulting from local BMP implementation. The data collected during this permit term will build upon the set of regional data needed from each site for meaningful trend analysis.

This proposal also includes a more comprehensive biomonitoring component. Since assessing the impact of urban runoff on receiving stream quality is a primary focus of this program, assessing the biological integrity of the streams is fundamental. With this proposed plan, 24 watersheds will be chemically monitored and 12 watersheds will be bioassessed across the region, with substantial overlap between the two sampling approaches.

A map with each entity's selected watersheds is shown in Figure 1. Specific locations of sampling sites in each watershed will be determined prior to each sampling year and will be submitted in each prior year's annual regional monitoring report. Refer to Table 2a&b for identification of the watersheds selected by each entity and their relative proportion to jurisdictional area. The relative percent and the area of the selected watersheds are indicated with bold type. Unbolded watersheds indicate unselected, shared watersheds that were selected by other entities. Most of the municipal entities were able to achieve the 50% coverage with only two watersheds; however, due to the size of their jurisdictional area, the City of Dallas selected eight watersheds and the City of Fort Worth selected six to monitor. Jurisdictional coverage was not considered in the selection of the two transportation agency watersheds.

The North Central Texas Council of Governments (NCTCOG) role in the regional monitoring program is to coordinate the overall program, obtain consultant assistance on behalf of the regional partners, assist participants in site selection and the development of the sampling protocol(s); collect and summarize the data; and generate/deliver annual compliance reports.

Sampling Metrics

Monitoring is proposed to commence January 1 of the year following the issuance of the City of Garland's permit, anticipated in mid-2011. Given the existing staggered permit expiration dates among the participants, it is likely that permit renewals issued by TCEQ will also be staggered. Consequently, the regional program will need to have written endorsement from TCEQ that participants will receive credit for any monitoring they contribute as part of the regional effort that would be applied toward their eventual permit. However, by incorporating a lag period to maintain a calendar year-based schedule, most of the participating permittees will likely have their renewals issued by then (i.e. January 1, 2011), making for a smoother transition.

Table 3 provides a detailed breakdown of the number and frequency of each partner's proposed sampling activity(ies). Most entities are chemically sampling one watershed in their jurisdiction for two consecutive years and then moving to a second watershed for another two years. There are a few exceptions to this standard pattern:

- The City of Dallas will need to sample at least six watersheds in order to achieve the 50% coverage; This will be accomplished by chemically sampling four watersheds and performing bioassessment in four additional watersheds as a part of the regional program.
- To achieve the 50% area coverage, the City of Fort Worth needs to sample six watersheds. They intend to bioassess all six watersheds at two locations twice a year for all five years of the permit term. For chemical sampling, they intend to collect in-stream samples at two sites within two watersheds each year. By the end of the third year, they will have monitored each of their six selected watersheds once. They propose to then select the top four most biologically-impaired watersheds to continue with a second sample in the remaining two years of the permit term. Table 3 reflects this sampling pattern of four watersheds being sampled

twice and two watersheds being sampled once for a total of 20 chemical samples in the permit term.

- The City of Mesquite has a unique situation where there are only two watersheds in their jurisdiction and the two creeks of those watersheds are almost wholly contained within the city limits. They would prefer to establish permanent in-stream monitoring stations in each of the two creeks and to sample them concurrently all four years. Due to the relatively small size of the watersheds, they feel they can adequately assess the urban runoff impact by strategically locating a single sampling station in each watershed.

Chemical Sampling Details

Each participating entity will be responsible for final selection of sampling sites. Samples will be collected from these sites according to the schedule identified previously and analyzed for the parameters listed in the table below. Following consultant recommendations (see Section II Lessons Learned…), Diazinon has been replaced with Carbaryl, and Cadmium has been dropped from the parameter list.

Entities may use in-house staff or a consultant of their choice for sample collection. Although we encourage the use of a common laboratory for analysis to ensure consistency, entities may also select the TCEQ-approved laboratory of their choice, as long as procedures are followed and data quality objectives are met as specified in the approved regional monitoring protocol (to be finalized prior to the first sampling year).

Table 4: List of Parameters

Parameter	Method of Collection
Oil & Grease	Grab
pH	Grab
E. coli	Grab
Total Coliforms	Grab
Total Dissolved Solids (TDS)	Composite
Total Suspended Solids (TSS)	Composite
Biochemical Oxygen Demand (BOD_5)	Composite
Chemical Oxygen Demand (COD)	Composite
Total Nitrogen	Composite
Dissolved Phosphorus	Composite
Total Phosphorus	Composite
Carbaryl	Composite
Total Arsenic	Composite
Total Chromium	Composite
Total Copper	Composite
Total Lead	Composite
Total Zinc	Composite

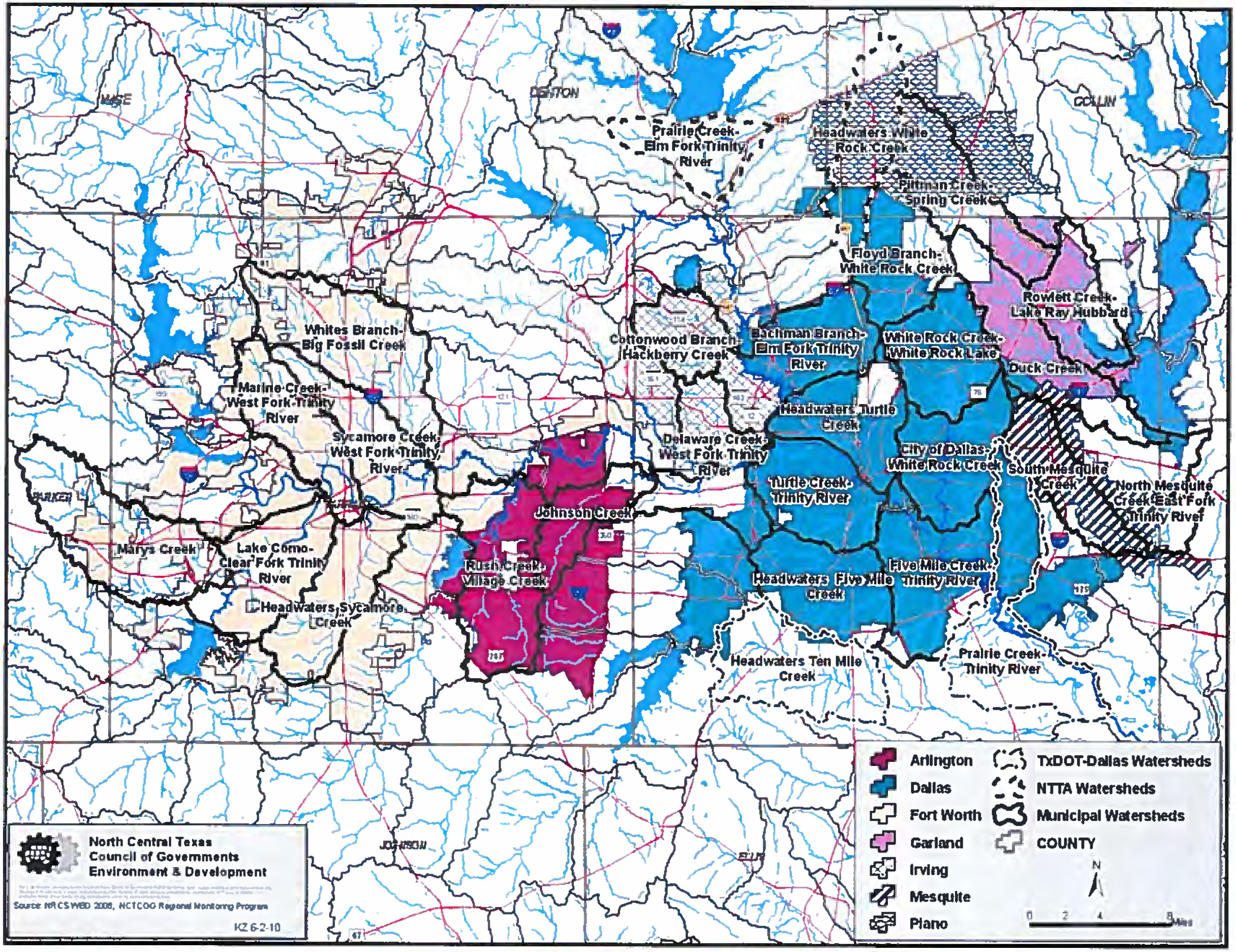


Figure 1: Regional Monitoring Entities & Selected HUC-12 Subwatersheds for Third Term Monitoring

Table 2a: RWWCP Watersheds Selected for Third Permit Term Monitoring

Area of City Sq mi. ⟶		Arlington 98.57		Dallas 385.92		Fort Worth 344.67		Garland 57.16		Irving 67.88		Mesquite 46.36		Plano 72.25	
HUC-12 Watersheds	*	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.
Johnson Creek	C	17.61%	17.36												
Rush Creek-Village Creek	C	35.51%	35.01												
Bachman Branch-Elm Fork Trinity River	B			7.98%	30.79					16.16%	10.97				
City of Dallas-White Rock Creek	C			9.00%	34.75							0.27%	0.13		
Five Mile Creek-Trinity River	C			10.79%	41.66										
Floyd Branch-White Rock Creek	B			5.5%	21.3									3.1%	2.2
Headwaters Five Mile Creek	B			9.00%	34.74										
Headwaters Turtle Creek	C			7.4%	28.4										
Turtle Creek-Trinity River	C			8.94%	34.5										
White Rock Creek-White Rock Lake	B			8.73%	33.7			1.40%	0.83						
Headwaters Sycamore Creek	BC					10.22%	35.22								
Lake Como-Clear Fork Trinity River	BC					9.79%	33.74								
Marine Creek-West Fork Trinity River	BC					8.58%	29.56								
Mary's Creek	BC					6.29%	21.69								
Sycamore Creek-West Fork Trinity River	BC					6.77%	23.32								
Whites Branch-Big Fossil Creek	BC					9.73%	33.52								
Duck Creek	BC			0.92%	3.56			42.19%	24.11			5.75%	2.67		
Rowlett Creek-Lake Ray Hubbard	BC			0.63%	2.42			29.92%	17.1						
Cottonwood Branch-Hackberry Creek	C			0.04%	0.15					29.90%	20.29				
Delaware Creek-West Fork Trinity River	C			1.53%	5.91					22.16%	15.04				
North Mesquite Creek-East Fork Trinity River	C			0.39%	1.5							26.82%	12.43		
South Mesquite Creek	C			0.22%	0.85							54.27%	25.16		
Pittman Creek-Spring Creek	BC							16.04%	9.17					25.42%	18.37
Headwaters White Rock Creek	BC			1.66%	6.42									26.2%	18.93
Totals of selected (bolded) watersheds ⟶		53.12%	52.37	67.34%	259.84	53.76%	185.24	72.11%	41.21	52.06%	35.33	81.09%	37.59	51.62%	37.3

* (C) – Chemical (B) – Bioassessment (BC) – Both Bioassessment & Chemical

"HUC12 Sq. Mi" indicates the area of the watershed within the jurisdictional boundary

Table 2b: RWWCP Watersheds Selected for Third Permit Term Monitoring
Transportation Agencies

Area of City Sq mi. ⟶	*	Arlington 98.57		Dallas 385.92		Fort Worth 344.67		Garland 57.16		Irving 67.88		Mesquite 46.36		Plano 72.25	
HUC-12 Watersheds		% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.	% of City	HUC12 Sq. Mi.
TxDOT- Dallas Selected Watersheds															
Headwaters Ten Mile Creek	C			0.7%	2.5										
Prairie Creek-Trinity River	C			4.7%	18.0							1.6%	0.7		
NTTA Selected Watersheds															
Headwaters White Rock Creek	C			1.66%	6.42									26.2%	18.93
Prairie Creek-Elm Fork Trinity River	C														
Totals of all watersheds (in this table only) ⟶				7.06%	26.92							1.6%	0.7	26.2%	18.93

Table 3: Sampling Metrics

	Chemical Sampling									Bioassessment Sampling				
	Annual				Permit Term					Annual			Permit Term	
Entity	Sampling Sites per Watershed A	Number of Watersheds Sampled B	Frequency of Sampling C	Total Annual Samples D (A×B×C)	Number of Years Sampling E	Total Samples For Permit Term F (D×E)	Number of Watersheds Sampled G	Number of Samples Taken in Each Watershed H (F÷G)	Number of Samples Per Site I (H÷A)	Sites Per Watershed Per Year J	Frequency of Sampling K	Watersheds Per Year L	Number of Years Sampling M	Total Samples N (J×K×L×M)
Arlington	3	1	4	12	4	48	2	24	8	-	-	-	-	-
Dallas	3	2	4	24	4	96	4	24	8	1	2	4	4	32
Fort Worth	2	2	1	4	4 and 1	16 + 4	4 and 2	4 + 2	2 and 1	2	2	6	5	120
Garland	3	1	4	12	4	48	2	24	8	1	2	1	4	8
Irving	3	1	4	12	4	48	2	24	8	-	-	-	-	-
Mesquite	1	2	4	8	4	32	2	16	8	-	-	-	-	-
Plano	2	1	4	8	4	32	2	16	8	1	2	1	4	8
NTTA	2	1	4	8	4	32	2	16	8	-	-	-	-	-
TxDOT-Dallas	2	1	4	8	4	32	2	16	8	-	-	-	-	-

Grab samples will be collected during the first flush and analyzed for *E. coli*, total coliforms, oil and grease, and pH. An additional first flush sample and four subsequent samples collected at equal time intervals will be taken over the first two hours of the event and combined for a composite sample. Samples will be collected for no more than two hours, regardless of storm duration. The grab samples can be obtained either manually or from some type of automated collection device to better address safety concerns. Sampling will be conducted only on qualifying events which are defined as satisfying the following requirements: 1) Antecedent dry period of 72 hours minimum; 2) Rainfall volume of 0.10 inch minimum; and a 3) Quantifiable increase in water surface elevation attributable to storm water runoff. Rain gauges will be deployed in each watershed to support assessment of local wet weather conditions.

Bioassessments

The recent National Research Council (NRC) report *Urban Stormwater Management in the United States* recommends including bioassessments for assessing storm water management program progress. It also recommends that storm water management strategies should address all stressors to a stream which can be accomplished through biological monitoring since biota naturally integrate the environmental conditions that impact them. TCEQ has continued the option established by EPA in the MS4 permit language of allowing bioassessments to be used as a replacement for a portion of the chemical monitoring requirement. The RWWCP has always had a bioassessment component as part of its overall approach and the partners would like to continue including it. In fact, this proposal suggests a greater use of bioassessments across the region than ever before.

Both EPA and TCEQ have developed an array of methods and approaches that can be used in conducting bioassessments. Each of these regulatory entities has developed manuals outlining these various steps. As EPA states in their manual, Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, 2nd Ed. (1999) the protocols described are not "intended to be used as a rigid protocol without regional modifications. Instead, they provide options for agencies or groups that wish to implement rapid biological assessment and monitoring techniques."

As such, the regional program participants that are implementing bioassessments (Dallas, Fort Worth, Garland and Plano) will be performing bioassessment based upon standardized protocols as set forth in applicable EPA and TCEQ manuals. These protocols will be detailed in each annual report but generally involve habitat assessment, a measurement of standard field physical conditions, and collection and identification of macroinvertebrates and possibly other biota. Watershed parameters will be compared to a baseline standard to determine the habitat's health, through use of a reference site or other methods. The number of watersheds being sampled, stations per watershed and samples per year using bioassessment protocols are all listed in Table 3.

IV. Summary of the RWWCP Proposal for the Third Permit Term

In summary:

- Each participant has selected watersheds to achieve greater than 50% coverage of their jurisdictional area.
- To increase statistical robustness, most watersheds will be sampled for a minimum of two years.
- Most watersheds will be sampled quarterly; Fort Worth is putting a greater effort into the bioassessment sampling instead.
- The number of sites per watershed varies per entity based on local conditions.
- Arlington, Dallas, Garland, Irving, Mesquite, Plano, NTTA and TxDOT-Dallas will collect samples for the first four years of the five-year permit term.
- Fort Worth has elected to perform chemical monitoring for the entire five-year permit term.
- 17 chemical parameters will be analyzed in each storm event sample
- Dallas, Fort Worth, Garland and Plano will also do biological assessments.

NCTCOG
ATTACHMENT B - PART A FIELD COLLECTION AND ANALYSIS OF STORM WATER SAMPLES

COST SUMMARY

		Level of Effort				
	Task	**Hours**	**Personnel Costs**	**Laboratory Costs**	**Other Direct Expenses**	**Total**
A. Project Management & Coordination						$ -
B. SAPP/QAPP						$ -
C. Field Sampling and Analyses						$ -
ARL	Johnson Creek					$ -
	Rush Creek					$ -
DAL	City of Dallas White Rock Creek					$ -
	Five Mile Creek - Trinity River					$ -
	Headwaters Turtle Creek					$ -
	Turtle Creek - Trinity River					$ -
GAR	Duck Creek					$ -
	Rowlett Creek - Lake Ray Hubbard					$ -
IRV	Cottonwood Branch - Hackberry Creek					$ -
	Delaware Creek - West Fork Trinity River					$ -
MES	North Mesquite Creek - East Fork Trinity River					$ -
	South Mesquite Creek					$ -
PLN	Pittman Creek - Spring Creek					$ -
	Headwaters White Rock Creek					$ -
TxDOT	Headwaters Ten Mile Creek					$ -
	Prairie Creek					$ -
NTTA	Headwaters White Rock Creek					$ -
	Prairie Creek - Elm Fork Trinity River					$ -
D. Annual Report (Four Permit Years)						$ -
	Compile Data					$ -
	Draft Report					$ -
	Final Report					$ -
E. Electronic Data Monitoring Report (Four Permit Years)						$ -
	Data QA/QC					$ -
	Draft for Participant Review					$ -
	Submit to TCEQ					$ -
F. Final Summary Report (End of Permit Term)						$ -
	Compile Data					$ -
	Draft Report					$ -
	Final Report					$ -
	TOTAL	0	$ -	$ -	$ -	$ -

	Unit Cost Per Sample Location					

ARL - City of Arlington
DAL - City of Dallas
GAR - City of Garland

IRV - City of Irving
MES - City of Mesquite
PLN - City of Plano

TxDOT - Texas Department of Transportation

NTTA - North Texas Tollway Authority

NCTCOG

ATTACHMENT C - PART B - BIOMONITORING SAMPLING AND ANALYSES

COST SUMMARY

		Level of Effort				
	Task	**Hours**	**Personnel Costs**	**Laboratory Costs**	**Other Direct Expenses**	**Total**
A. Project Management & Coordination						$ -
B. SAPP/QAPP						$ -
C. Field Sampling and Analyses						$ -
DAL	Bachman Branch - Elm Fork Trinity River					$ -
	Floyd Branch - White Rock Creek					$ -
	Headwaters Five Mile Creek					$ -
	White Rock Creek - White Rock Lake					
GAR	Duck Creek					$ -
	Rowlett Creek - Lake Ray Hubbard					$ -
PLN	Pittman Creek - Spring Creek					$ -
	Headwaters White Rock Creek					$ -
D. Annual Report (Four Permit Years)						$ -
	Compile Data					$ -
	Draft Report					$ -
	Final Report					$ -
E. Electronic Data Monitoring Report (Four Permit Years)						$ -
	Data QA/QC					$ -
	Draft for Participant Review					$ -
	Submit to TCEQ					$ -
F. Final Report (End of Permit Term)						$ -
	Compile Data					$ -
	Draft Report					$ -
	Final Report					$ -
	TOTAL	**0**	**$ -**	**$ -**	**$ -**	**$ -**

	Unit Cost Per Sample Location					

DAL - City of Dallas
GAR - City of Garland
PLN - City of Plano

Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Jon Niermann, *Commissioner*
Richard A. Hyde, P.E., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

June 30, 2017

Ms. Derica Peters, Senior Planner
North Central Texas Council of Governments (NCTCOG)
P.O. Box 5888
Arlington, Texas 76005-5888

Re: Approval of the North Central Texas Regional Wet Weather Characterization Plan Proposal for the Fourth Permit Term

Dear Ms. Peters:

The Texas Commission on Environmental Quality (TCEQ) received the final revised North Central Texas Regional Wet Weather Characterization Plan Proposal for the Fourth Permit Term (Proposal) on June 12, 2017, along with your response letter. The Proposal was originally submitted to TCEQ for review via electronic mail on October 11, 2016. TCEQ and EPA reviewed the Proposal and submitted comments to NCTCOG on March 7, 2017, and further discussed our comments with NCTCOG on a telephone conference on April 11, 2017.

We appreciate the opportunity to review the Proposal and appreciate NCTCOG' efforts to update the Proposal and provide responses to EPA's and TCEQ's comments. All comments have been addressed and TCEQ approves this Proposal for the fourth permit term.

If you have any questions, you are most welcome to call me at (512) 239-4784 or Ms. Hanne Nielsen at (512) 239-6524.

Best regards,

Rebecca L. Villalba

Rebecca L. Villalba, Team Leader
Stormwater & Pretreatment Team (MC 148)
Water Quality Division

RLV/HN/fc

cc: Ms. Allison Henry, Environment and Development Planner
North Central Texas Council of Governments (NCTCOG), P.O. Box 5888
Arlington, Texas 76005-5888

Appendix B:

Monitoring Program and Quality Assurance Project Plan for Wet Weather Characterization Equipment Deployment and Sampling Protocol: 2018-2022

SNC · LAVALIN

ATKINS
Member of the SNC-Lavalin Group

Regional Wet Weather Characterization Program, Permit Term Four

Monitoring Program and Quality Assurance Project Plan for Wet Weather Equipment Deployment and Sampling Protocol: 2018–2021

Prepared for:

North Central Texas Council of Governments
P.O. Box 5888
Arlington, Texas 76005-5888

Prepared by:

Atkins
17304 Preston Road, Suite 1300
Dallas, Texas 75252

Texas Board of Professional Engineers
Certificate of Registration Number F-474

May 1, 2018

Table of Contents

Acronyms and Abbreviations

BMP	Best Management Practice
CDMA	code division multiple access
DFW	Dallas-Fort Worth
EDD	electronic data deliverable
EPA	Environmental Protection Agency
FSO	Field Sampling Organization
LCD	liquid crystal display
MS4	Municipal Separate Storm Sewer System
NBS	National Bureau of Standards
NCTCOG	North Central Texas Council of Governments
NTTA	North Texas Tollway Authority
NWSWFO	National Weather Service Weather Forecast Office
PPE	personal protective equipment
QA	quality assurance
QAPP	Quality Assurance Project Plan
RWWCP	Regional Wet Weather Characterization Program
QC	quality control
TMDL	Total Maximum Daily Load
TCEQ	Texas Commission on Environmental Quality
TPDES	Texas Pollutant Discharge Elimination System
TxDOT	Texas Department of Transportation
USGS	U.S. Geological Survey
UTC	Coordinated Universal Time

1.0 Introduction

1.1 Background

Since 1996, a regional storm water monitoring program has been ongoing in the Dallas-Fort Worth (DFW) metropolitan area among the seven largest cities and major transportation agencies for compliance with Federal and State storm water permit requirements. During the initial permit term (1996–2001), seven municipalities (Dallas, Fort Worth, Arlington, Irving, Garland, Plano and Mesquite) and the Dallas and Fort Worth Districts of the Texas Department of Transportation (TxDOT) received joint approval from U.S. Environmental Protection Agency (EPA) for a regional monitoring program which utilized the assistance of a shared consultant team and the United States Geological Survey (USGS) to sample and analyze 22 outfalls primarily from small watersheds of a predominantly single land use type. The Participants listed above worked through the North Central Texas Council of Governments (NCTCOG) to form a regional partnership and strategy to conduct wet-weather monitoring activities for the regional monitoring program.

The sample collections served to characterize typical urban runoff from limited land use types, and were useful for estimating general pollutant loadings. However, they did not directly evaluate impacts on actual receiving streams.

1.1.1 Second Permit Term

In the second permit term (2005–2010), the permit was administered by the Texas Commission on Environmental Quality (TCEQ) and implemented through NCTCOG and a consultant team led by Atkins. Approval was obtained to utilize in-stream stations for the regional monitoring program to more directly assess the impact of storm water within receiving streams. The revised program was termed the Regional Wet Weather Characterization Program (RWWCP) and was added as an option in Part IV.A.3 of the Texas Pollutant Discharge Elimination System (TPDES) Municipal Separate Storm Sewer System (MS4) permits issued to the Phase I North Central Texas governmental entities. The primary goal of the in-stream monitoring program was to obtain baseline data on receiving streams in the DFW Metroplex for use in determining long-term water quality trends. Since the RWWCP language existed outside of each permit, it allowed greater flexibility for making changes to the program. During this second permit term, the North Texas Tollway Authority (NTTA) joined the regional program. All other participants remained the same, except for the TxDOT-Fort Worth District who became a co-permittee with the cities of Fort Worth and Arlington and were no longer required to conduct wet weather monitoring. According to the original RWWCP protocol, municipal Participants collected data from three sampling sites in the watershed (typically upstream, midstream and downstream) and the transportation agencies collected data from two sites (upstream and downstream stations only). Samples were collected quarterly from each site during a qualifying rain event and were analyzed for 18 parameters.

As an added component, the City of Fort Worth selected the Representative Rapid Bioassessment Monitoring Option (Part IV.A.2) in their permit, which allowed the chemical sampling frequency to be reduced from four times per year per site to once per year per site. In its place, two bioassessments were conducted each year at a minimum of nine sites. These bioassessments were based on protocols developed by the EPA. A summarization of this bioassessment data was included along with the chemical data in the annual regional monitoring report each year of the permit term.

1.1.2 Third Permit Term

In the third permit term (2011–2016), the Cities of Arlington, Dallas, Fort Worth, Garland, Irving, Mesquite and Plano, together with the North Texas Tollway Authority and TxDOT-Dallas District agreed to continue their regional partnership and work cooperatively through the NCTCOG and Atkins to develop a revised RWWCP. This revised plan effectively monitored at least 50% of each entity's jurisdictional area by the end of the permit term. This extension of jurisdictional coverage allowed a reasonable assessment of each entity's jurisdictional watersheds while also achieving a balance among the various goals of obtaining valid scientific information, meeting permit compliance, and addressing what is practicable for each entity. The primary goal of the RWWCP during this permit term was to continue the assessment of urban impact on receiving stream water quality and to document any improvement presumably resulting from local BMP implementation. The data collected during this permit term built upon the set of regional water quality data collected under the previous term needed for meaningful trend analysis. Since assessing the impact of urban runoff on receiving stream quality is a primary focus of this program, assessing the biological integrity of the streams was deemed fundamental in the third term. During the third term, 24 watersheds were chemically monitored and 12 watersheds were bioassessed across the region, with substantial overlap between the two sampling approaches.

At the end of the third permit term's sampling effort, a final summary report was prepared by Atkins to assess the sampling effort. The report found that in more than half of the watersheds sampled had high bacteria exceedances, with the average number of nine exceedances in these watersheds. Stream degradation was noted by Atkins' monitoring team in about half of the sampled watersheds based on the data analyzed, and additional monitoring was recommended at these sites.

The report analyzed each of the monitored watersheds, and looked at characteristics specific to each watershed. This approach provided more usable information for each entity, and each individual watershed's information can be reviewed and used to implement BMPs and other monitoring practices in the future. Many of the watersheds that were studied in the third term were classified as high priorities to be studied again due to the data was collected during the third term. The watersheds that were classified as high priority were generally those with stream degradation, those with high number of exceedances of criteria of monitored parameters, and those with existing TMDLs.

Taking into account each watershed's characteristics and evaluating the RWWCP as a whole, Atkins made various recommendations for modifying the RWWCP in the next term, including the following that were applied to the proposal:

- Focus on Impaired Waterbodies –This suggestion is supported by TCEQ and EPA feedback provided to NCTCOG and the monitoring Participants. Atkins suggests a focus on monitoring impaired water bodies will also help with TMDL efforts already underway in the area.
- Rapid bio-assessment improvements – Rapid bio-assessments should continue to be part of the RWWCP, and entities that are not currently completing RBAs should be encouraged to do so. Atkins recommends that the parameters that are recorded during bio-assessment chemical monitoring activities be expanded to include/match those of the wet weather monitoring to allow for easier comparison.

- Revise monitored pollutants: Pesticides and Herbicides – During the third permit term, Carbaryl was chosen to replace Diazaon that was undetected in the second permit term. Carbaryl was not detected in any watershed during the third permit term, and therefore was recommended that it no longer be monitored for the fourth permit term. Suggestions for replacement are dieldrin or atrazine.
- Revise monitored pollutants: indicator bacteria – Remove total coliforms from list of monitoring parameters. There is no recognized correlation between total coliforms and fresh water pathogens by TCEQ or EPA.
- Revise monitored pollutants: nutrients – Add ammonia nitrogen, nitrate nitrogen, and ortho-phosphate to the monitoring parameters for wet weather chemical monitoring. These additions would allow for better comparisons between bioassessment and wet weather chemical monitoring results.
- Revise monitored pollutants: metals – For the Duck Creek, Johnson Creek, and White Rock Creek (headwaters) subwatersheds, it is recommended that sampling of dissolved fractions of metals is conducted in order to determine the concentration of bioavailable metals.

Many of these recommendations were incorporated in the proposal for the fourth permit term.

1.1.3 Current (Fourth) Permit Term

For the current permit term (2018 to 2022), the cities of Arlington, Dallas, Fort Worth, Garland, Irving, Mesquite, and Plano and the NTTA agreed to continue their regional partnership to work cooperatively through the NCTCOG to develop a revised regional monitoring program. TxDOT obtained a statewide permit incorporating both the Dallas and Fort Worth Districts, which removed the requirement to conduct wet weather monitoring. The revised regional monitoring program, which was approved by the TCEQ in 2017, incorporates the recommendations from the previous program outlined above.

The municipal regional Participants proposed to continue to use a sampling plan that will effectively monitor at least 50% of their jurisdictional area by the end of the permit term. As in the previous term, in-stream watershed monitoring will be continued to obtain greater statistical robustness of the data by increasing the sampling at each location for a minimum of two years. The Participants will maintain fixed sampling stations to the extent practicable. This will enable the data to be examined for trends and show improvements or decline in water quality within the fixed sampling period.

Watersheds that will be monitored were prioritized based on TMDLs and 303d streams which were in watersheds that cover the jurisdictional area of the municipalities. Participants proposed to monitor in these impaired waterbodies in order to better assess the impacts of storm water on these impaired streams. It is primarily the same area monitored during the previous permit terms with some additional watersheds.

In October 2017, a consultant team led by Atkins and including subconsultants Freese and Nichols, Inc. and Dougherty Sprague Environmental, Inc. was reselected to continue providing regional storm water monitoring services. Atkins will perform a variety of storm water monitoring compliance activities for the Cities of Arlington, Garland, Irving, Mesquite, and Plano, along with NTTA including storm water monitoring, bioassessments, and a BMP Analysis and Evaluation Plan. The bioassessment monitoring plan and BMP Analysis and Evaluation Plan will be provided in separate submittals. This document defines procedures for storm water sampling, sampling equipment and deployment, field trip preparation, sample retrieval, laboratory analysis, and post-sampling activities. Dallas and Fort Worth are part of the approved regional monitoring plan; however, this document is specific to the storm water monitoring activities for the Cities of Arlington, Garland, Irving, Mesquite, Plano, and NTTA.

1.2 Purpose of this Document

The purpose of this document is to fulfill the TPDES permit requirement held by the Cities of Arlington, Garland, Irving, Mesquite, Plano, and NTTA, and to provide instructions for the NCTCOG consulting staff on storm water sampling, sampling equipment and deployment, field trip preparation, sample retrieval, laboratory analysis, and post-sampling activities for the current permit term (2018 through 2022). This document will allow storm water monitoring to be conducted in an effective, consistent, and efficient manner. Results obtained from the monitoring described in this document will be submitted to the NCTCOG to meet compliance obligations for the TPDES permit holders. Data collected under this protocol will be used to assess wet weather in-stream conditions.

1.3 Organization of Document

The remainder of this document includes separate sections addressing different aspects of the monitoring protocol for the project.

Section 2.0 – Roles and Responsibilities: Describes the roles and responsibilities of all project participants.

Section 3.0 – Site Information: Provides information about the site locations and precipitation and hydrologic information.

Section 4.0 – Sampling Equipment: Provides an overview of the sampling equipment and programming requirements, including automatic sampler deployment and equipment protection procedures.

Section 5.0 – Sampling Strategy and Collection Procedures: Describes field trip preparation, mobilization, sample retrieval procedures, monitoring constituents, and quality assurance (QA)/quality control (QC) field samples to be obtained.

Section 6.0 – Sample Handling and Documentation: Describes information regarding chain-of-custody requirements and containers and preservatives.

Section 7.0 – Precipitation Monitoring: Describes the precipitation monitoring approach, including equipment, locations, maintenance, calibration, and data management.

Section 8.0 – Flow and Pollutant Load Estimations: Describes the methodology to be used to calculate flows and pollutant loads.

Section 9.0 – Laboratory Analysis: Provides laboratory sample preparation and data reports information.

Section 10.0 – Quality Assurance Project Plan: Outlines the required field and laboratory quality assurance procedures to be used.

Section 11.0 – Post-Sampling Activities: Discusses equipment maintenance, data management and retrieval, and redeployment of equipment.

Section 12.0 – Health and Safety: Addresses the health and safety of field sampling staff, including personal protective equipment and anticipated hazards, and provides emergency contact information.

Section 13.0 – References: Includes a list of references used to prepare this document.

2.0 Roles and Responsibilities

The names and responsibilities of the organizations involved in the orchestration and implementation of the regional storm water monitoring program are described in this section.

2.1 Monitoring Organization

The NCTCOG represents several municipalities in the Greater Dallas-Fort Worth Metroplex. Participating municipalities in this monitoring plan include the Cities of Arlington, Garland, Irving, Mesquite, and Plano, and the roadway authority of NTTA.

2.2 Monitoring Plan Developer

The monitoring plan was developed by Atkins. During the development of the monitoring plan, the plan developer is responsible for:

- Making updates and revisions to the monitoring plan according to *"The North Central Texas Regional Wet Weather Characterization Plan Proposal for the Fourth Permit Term"* (NCTCOG, 2017) and comments requested by the monitoring organization.
- Reviewing monitoring results and assisting the monitoring organization in implementing the monitoring plan.
- Assisting NCTCOG in coordinating the storm water activities of all involved organizations.

2.3 Field Sampling Organization

The Field Sampling Organization (FSO) will be Atkins, assisted by subconsultants Freese and Nichols, Inc. and Dougherty Sprague Environmental, Inc. The FSO will be responsible for executing the storm water monitoring activities as defined in this monitoring plan. Activities include monitoring equipment installation, maintenance, and calibration; sample collection; preparing the required reports; conducting the required equipment maintenance; validation tasks; QA tasks; and data reporting activities. The FSO will:

- Coordinate monitoring activities with participants on equipment delivery and pickup.
- Contract and coordinate with the analytical laboratory, contractors, and subconsultants necessary for implementation of the monitoring plan.
- Provide needed logistical support to field sampling crews, establish a communication network, and schedule and coordinate monitoring activities.
- Oversee or conduct field monitoring activities in accordance with the approved monitoring plan/ quality assurance project plan (QAPP).
- Prepare and maintain all field records and QA/QC forms.
- Receive, review, manage, and validate all laboratory reports.
- Prepare and submit all collected data to NCTCOG in accordance with protocol requirements and enter into the regional program monitoring database.

- Store hard copies.
- Assist in the review of annual reports.

2.4 Analytical Laboratory

The laboratory will be responsible for conducting QA tasks, laboratory analysis of samples, and reporting in accordance with the Sections 5.4, 6.0, 9.0, and 10.0 of the monitoring plan. The laboratory will also:

- Review monitoring plan/QAPP.
- Verify that all samples delivered to the laboratories meet applicable QA requirements listed in approved QAPP.
- Process and prepare composite and grab samples for analyses of the monitoring constituents listed in Section 5.4 of this monitoring plan.
- Analyze collected samples according to the methods listed in Section 5.4 of this monitoring plan.
- Conduct all necessary QA testing according to Section 10.0 of this monitoring plan.
- Report test results and QA data to the FSO according to Section 9.0 of this monitoring plan.

2.5 Communications Protocol

Communications within Atkins and between the subcontractors will be conducted by the Project and Task Managers or designated personnel. Managers and appropriate subcontractor staff will be copied on scope or policy issues along with day-to-day messages regarding the weather.

Communications to and from NCTCOG and the sampling teams will be conducted through Derica Peters of NCTCOG (or delegate) and Chad Richards (Atkins) for regional monitoring-related items, including sampling activities and laboratory results. Designated staff will be copied on scope and policy issues.

Sampling personnel may be divided into multiple field teams and office leaders if necessary. Each field team will consist of one field team leader and one field assistant. The office leader will remain in communication with the field team leaders and liaise between the field teams and the laboratory. The office leader will remain aware of potential weather and traffic concerns and alert the field teams as needed.

3.0 Site Information

This section describes the monitoring site locations that have been chosen for storm water monitoring during the calendar years of 2018–2021.

3.1 Site Locations

The watershed maps and deployment locations are provided in Appendix A.

3.2 Precipitation and Hydrology Information

All sites are located within the Dallas-Fort Worth Metroplex, which is approximately 250 miles north of the Gulf of Mexico. The climate is a mix of subtropical with humid, hot summers, and continental with wide ranges in annual temperature extremes. Rain occurs in the winter months associated with Pacific and Arctic cold fronts and in the summer months with thunderstorm activity. Rainfall occurs most frequently at night, with the highest amounts falling during the months of May and October (National Weather Service Weather Forecast Office [NWSWFO], 2011).

Rainfall records (1981–2010 data from NWSWFO, 2011) from the atmospheric monitoring station located at the Dallas-Fort Worth International Airport report a normal annual rainfall amount of 36.14 inches. Figure 3-1 shows each month with its corresponding normal rainfall volume.

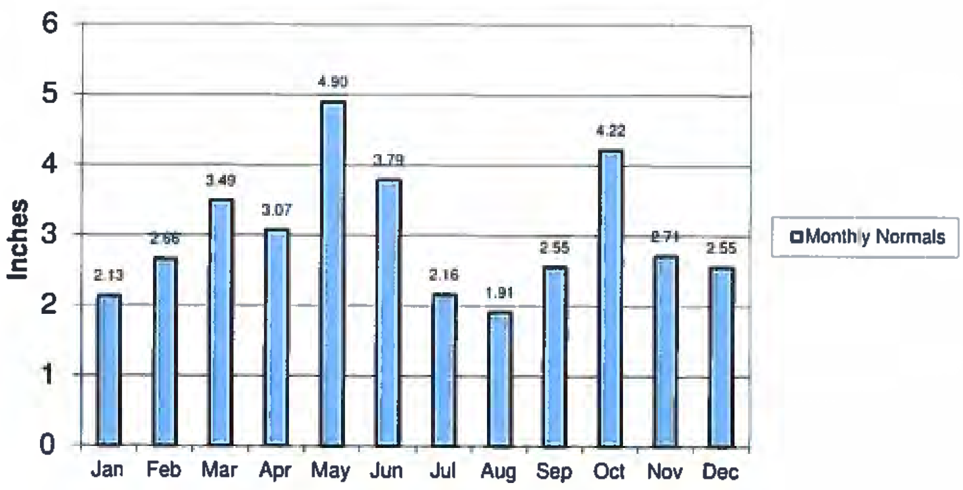


Figure 3-1 Monthly Distribution of Normal Rainfall Patterns (NWSWFO, 2011)

3.3 2018–2019 Monitoring Stations

The following are the monitoring station locations for each entity and the associated watersheds.

Arlington – Johnson Creek and Fish Creek – Mountain Creek Lake

- Johnson Creek at Six Flags (AR1801/1901)
- Fish Creek at SH 360 (AR1802/1902)

Garland – Duck Creek

- Duck Creek at Shiloh Bridge (GA1801/1901)
- Duck Creek between Forest North and South (GA1802/1902)
- Duck Creek under La Prada Bridge (GA1803/1903)

Irving – Delaware Creek

- Delaware Creek at Sowers Road (IR1801/1901)
- Delaware Creek at Oakdale (IR1802)

Mesquite – South Mesquite Creek and North Mesquite Creek

- North of New Market Road (MS1801)
- North Mesquite Creek at Edward's Church (MS1802)

Plano – Spring Creek

- Spring Creek at 16th Street (PL1801)

NTTA – Cottonwood Branch – Hackberry Creek and Cottonwood Creek – Mountain Creek Lake

- Unnamed Tributary at SH 161 North of Gateway Drive (NT1801)
- Cottonwood Creek at SH 161 South of Dickey Road (NT1802)

Maps and photos of the sites may be found in Appendix A. The equipment located at each station is discussed in detail in Section 4.0.

3.4 2020–2021 Monitoring Stations

This subsection will be finalized prior to the monitoring activities of 2020.

4.0 Sampling Equipment

This section presents an overview of the sampling equipment and deployment.

4.1 Overview of Equipment

Storm water monitoring equipment to be utilized at the sites includes:

- ISCO 6712 Automatic Sampler and Suction Line
- ISCO 730 Bubbler Flow Module and Bubbler Line
- ISCO CDMA Cellular Phone System
- ISCO 674 Rain Gauge (upstream sites only)

The storm water sampling will be conducted using an ISCO 6712 automatic sampler. The automatic sampler uses a battery-powered peristaltic pump to draw water through a strainer and flexible sample tube. The storm water sample will be collected using four 1-gallon glass containers located within the automatic sampler housing. Sampling will be triggered by a quantifiable increase in water surface elevation within the stream conveyance channel within a one-hour window. A 730 Bubbler Flow Module will be attached to a tube connected to the automatic sampler to monitor the water level increase. A computer processor with LCD display will allow programming of sampler functions, such as collection intervals and sample volumes, and additional data recording. A CDMA Cellular Phone System will be used on one sampler within the designated watershed to notify field crews that the sampling routine has been initiated. The cellular phone system is used only as an option to alert staff. A deep-cycle marine battery will provide power to the automatic sampler and related equipment. At applicable sites where a clear view of the sky is available, solar panels may be installed to provide a trickle charge to the deep-cycle marine battery. Vendor literature is provided in Appendix B.

Data from the ISCO 674 Rain Gauge, 6712 automatic sampler, and 730 Bubbler Flow Module will be downloaded during sample collection and reported with the laboratory data or, during dry periods, downloaded on a monthly basis by the FSO.

4.2 Automatic Sampler Deployment

4.2.1 Pump and Sample Bottle Housing

The automatic sampler will be located on a stable and flat surface within a storm water sample shelter. The equipment will be securely fastened by a steel cable to a solid object, such as a tree or earth anchor, to prevent removal by high flood events or vandals. The equipment will be located downstream of the solid object and the chain will have no slack. The automatic sampler and battery will be anchored suitably so that they are not tipped over by wind or water.

4.2.2 Suction Line

The automatic sampler will be located outside the conveyance and above the normal water surface elevation. The sampler pumps typically can provide about 25 to 28 vertical feet of suction lift. Placing the sampler higher will cause lower velocities than the 2 feet per second needed to collect representative samples, especially when considering solids content. Excessive elevation lift can also cause sampling to fail. Placing the sampler at longer horizontal distances will result in large friction losses along the sampler tube.

Where possible, the strainer or suction line intake will be located near the center of a straight length of channel. Soils, vegetation, and debris present in earthen channels can clog the collection tube intake. The suction line intake must not be clogged by debris and the suction line must not be displaced. To achieve this, the intake will be securely fastened above the streambed with the open end of the intake pointing downstream. The intake may be fastened to a steel stake or reinforcing bar driven into the center of the stream channel or attached to the side of the channel. Wire, cable ties, or hose clamps will be used to fasten the intake to the steel stake or sides of the channel. The tubing will not be crimped and vertical loops that can trap water in the tubing will be avoided.

4.2.3 Bubbler Module and Tubing

The 730 Bubbler Module uses a differential pressure transducer and a flow of bubbles to measure liquid levels up to 10 feet. The bubbler is unaffected by wind, fluctuations in air or liquid temperatures, turbulence, foam on the surface, corrosive chemicals, debris, oil, floating grease, or lightning. The bubbler tube will be secured similar to the suction line intake. Wire, cable ties, or hose clamps will be used to fasten the bubbler tubing to the steel stake. The tubing will not be crimped.

The bubbler module will be calibrated by measuring the depth of water and adjusting the reading to match as described in the vendor manual. The bubbler line will be routed and secured so that it does not disturb the flow. The mounting hardware will not be over-tightened to avoid kinking the tubing or restricting the airflow.

4.2.4 Sample Jar Installation and Securing

Sample jars will be set in the wire basket located in the bottom of the automatic sampler housing and positioned so the jar locations correspond to the numbers designated for collection. The wire retainer frame will be placed over the four jars and secured in place with the bungee cords located in the bottom of the automatic sampler housing.

4.2.5 Programming

The automatic sampler will be programmed to collect sample aliquots during storm events when the 730 Bubbler Module detects a quantifiable increase in water surface elevation (for example, 1-inch rise) within the stream conveyance channel within one hour. The automatic sampler will be programmed with three different activity modes: Disabled, Enabled, and Shut Down.

The automatic sampler will begin in "Disabled" mode. When the bubbler module detects a quantifiable rise in the stream channel within a one-hour window, the automatic sampler will switch from "Disabled" to "Enabled" mode. The sampler will perform a sample tube-cleaning routine consisting of an air purge followed by a tubing rinse. The sampler will then fill the first of the four 1-gallon glass containers located within the housing of the automatic sampler, which is considered time "0" in the programming sequence. The automatic sampler will collect an additional 0.5-gallon aliquot in the second 1-gallon glass container at time "0"; 0.5-gallon aliquots will be collected every 30 minutes after the sampler was enabled at time "0" up to 120 minutes.

The sampler will continue to take aliquots until 120 minutes has passed from the start of sample collection. Afterwards, the automatic sampler will "Shut Down." At the end of the programming sequence, aliquots will have been collected at 0 minutes, 30 minutes, 60 minutes, 90 minutes, and 120 minutes. Sample container one, or the grab sample container, will contain one 1-gallon aliquot, sample containers two and three will contain two 0.5-gallon aliquots, and sample container four will contain one 0.5-gallon aliquot.

Figures 4-1 through 4-4 provide a flow chart for programming of the samplers with 1 inch (as an example) used as the quantifiable rise to trigger the sample.

The most upstream site in each watershed will be equipped with an ISCO 674 Rain Gauge and CDMA Cellular Phone System. When the automatic sampler becomes "Enabled," an alarm will be sent to the FSO that the sampler has started sample collection activities.

4.2.6 Calibration and Testing

The automatic samplers will be calibrated and tested upon deployment. Sample volumes, depth measurements, and sampler programming will be verified. Volume calibration is described in Section 4.12 of the Teledyne ISCO 6712 Portable Samplers Installation and Operations Guide (Teledyne Isco, 2016). Calibration of the 730 Bubbler Module is described in the Teledyne ISCO 730 Bubbler Module Installation and Operations Guide (Teledyne Isco, 2013). These guides can be downloaded from www.isco.com.

4.2.7 Equipment Protection

Failure of the automatic sampler can occur from power failure, programming error, flood damage, theft, vandalism, or environmental conditions. Every effort will be taken to prevent failure and to protect the automatic sampler. Sufficient input will be obtained from ISCO technicians to reduce incidences of failure due to programming errors. The automatic sampler and battery will be hidden from view, secured with locks and cables, and enclosed in a shelter to reduce the possibility of theft or vandalism.

6712 SAMPLER EXTENDED PROGRAMMING For HELP at any screen press ? key.	This will appear briefly
RUN "EXTENDED 1" PROGRAM VIEW REPORT OTHER FUNCTIONS	Select PROGRAM
PROGRAM NAME: "EXTENDED 1 " CHANGE? YES NO	Select YES
SELECT NEW PROGRAM CHANGE PROGRAM NAME	Select CHANGE PROGRAM NAME
NAME: "STORM " ABCDEFGHIJKLMNOPQRST UVWXYZ-& 0123456789 BACK-UP DONE	Enter an appropriate program name
SITE: DESCRIPTION "FACTORY051" CHANGE? YES NO	Select YES
SITE: "SITE 54 " ABCDEFGHIJKLMNOPQRST UVWXYZ-& 0123456789 BACK-UP DONE	Enter the appropriate site name
SELECT UNITS FOR LENGTH: ft m	Select ft
SELECT UNITS FOR FLOW RATE cfs gps gpm Mgd lps m3s m3h m3d	Select gpm
SELECT UNITS FOR FLOW VOLUME cf gal Mgal m3 lit	Select gal
PROGRAM MODULE? YES NO	Select YES
MODE OF OPERATION FLOWMETER LEVEL ONLY	Select LEVEL ONLY
NEW MODULE SETUP– DOWNLOAD DATA NOW OR LOSE ALL DATA! DONE	Select DONE
CURRENT LEVEL IS ___.___ ft ADJUST LEVEL TO ___.___ ft	Key in the current level and press Enter
DATA STORAGE INTERVAL IN MINUTES 1 2 5 10 15 30	Select 5

Figure 4-1

Automatic Sampler Programming Flowchart Part 1

NEW MODULE SETUP-- DOWNLOAD DATA NOW OR LOSE ALL DATA! DONE	Select Done
NUMBER OF BOTTLES: 1 2 4 8 12 24	Select 4
BOTTLE VOLUME IS 1000 ml (300-30000)	Enter 3700
SUCTION LINE LENGTH IS 5 ft (3-99)	Enter length of suction line
AUTO SUCTION HEAD ENTER HEAD	Select AUTO SUCTION HEAD
0 RINSE CYCLES (0-3)	Enter 1
RETRY UP TO 0 TIMES WHEN SAMPLING (0-3)	Enter 3
ONE-PART PROGRAM TWO-PART PROGRAM	Select TWO-PART PROGRAM
24 BOTTLES AVAILABLE ASSIGN BOTTLES 1 THRU 6 TO PART 'A' (1-23)	Enter 1 (Screen will say "Beginning Part A")
UNIFORM TIME PACED FLOW PACED EVENT PACED NONUNIFORM TIME	Select UNIFORM TIME PACED
TIME BETWEEN SAMPLE EVENTS: 0 HOURS, 5 MINUTES	Enter 0 for HOURS and 5 for MINUTES
1 BOTTLES PER SAMPLE EVENT (1- 6)	Enter 1
SWITCH BOTTLES ON: NUMBER OF SAMPLES TIME	Select NUMBER OF SAMPLES
SWITCH BOTTLES EVERY 1 SAMPLES (1-50)	Enter 1
RUN CONTINUOUSLY? YES NO	Select NO

Figure 4-2
Automatic Sampler Programming Flowchart Part 2

DO YOU WANT SAMPLE VOLUMES DEPENDENT ON FLOW? YES NO	Select NO
SAMPLE VOLUME 200 ml (10-1000)	Enter 3700
ENABLE: RAIN LEVEL FLOW NONE	Select LEVEL
ENABLE: RAIN AND OR DONE	Select DONE
'LEVEL' CONDITION: SET POINT RANGE RATE OF CHANGE	Select RATE OF CHANGE
CONDITION IS TRUE WHEN 'LEVEL' RISES FALLS	Select RISES
'LEVEL' RISES 1.000 ft __HOURS, __MINUTES	Enter 0.086 ft and 1 HOURS, 0 MINUTES
ONCE ENABLED, STAY ENABLED? YES NO	Select YES
SAMPLE AT ENABLE? YES NO	Select YES
PAUSE RESUME 1. HH:MM DD HH:MM DD 2. HH:MM DD HH:MM DD CLEAR DONE	Select DONE (Screen will say "Beginning Part B")
UNIFORM TIME PACED FLOW PACED EVENT PACED NONUNIFORM TIME	Select NONUNIFORM TIME
NONUNIFORM TIME: CLOCK TIMES INTERVALS IN MINUTES RANDOM INTERVALS	Select INTERVALS IN MINUTES
FIRST SAMPLE AT START TIME, THEN . . .	Press Enter
QUANTITY AT INTERVAL 1. __ AT __ MIN 2. __ AT __ MIN 3. __ AT __ MIN	**Enter 4 at 30 MIN; 1 at 9999 MIN; and 0 for interval 3**
1 BOTTLES PER SAMPLE EVENT (1- 18)	Enter **1**

Figure 4-3

Automatic Sampler Programming Flowchart Part 3

SWITCH BOTTLES ON: NUMBER OF SAMPLES TIME	Select NUMBER OF SAMPLES
SWITCH BOTTLES EVERY 1 SAMPLES (1- 50)	**Enter 2 (It may ask you this after the next step depending on the programming set-up)**
RUN CONTINUOUSLY? YES NO	**Select NO (We want 3 bottles per event and 2 samples per bottles)**
SAMPLE VOLUME: 200 ml (10-1000)	Enter 1850
ENABLE: RAIN LEVEL FLOW NONE	**Select 'A' DONE**
ENABLE: RAIN AND OR DONE	Select DONE
ONCE ENABLED, STAY ENABLED? YES NO	Select YES
SAMPLE AT ENABLE? YES NO	Select YES
PAUSE RESUME 1. HH:MM DD HH:MM DD 2. HH:MM DD HH:MM DD CLEAR DONE	Select DONE
NO DELAY TO START DELAYED START CLOCK TIME WAIT FOR PHONE CALL	Select NO DELAY TO START
PROGRAMMING COMPLETE RUN THIS PROGRAM NOW? YES NO	Select YES

Figure 4-4
Automatic Sampler Programming Flowchart Part 4

5.0 Sampling Strategy and Collection Procedures

This section describes the strategies and procedures for collecting storm water samples.

5.1 Field Trip Preparation

The following procedures (as a minimum) will be followed to ensure successful field data collection at each of the 21 sampling locations selected for calendar years 2018–2021. At all times, the FSO will observe all the safety features and protocols described in Section 12.0 to ensure a safe field campaign.

5.1.1 Weather Monitoring

Current and forecasted weather will be monitored on a continuous basis to better anticipate field sampling collection events. Larger rainfall events result in increases in water surface elevations at downstream sites.

The depth of rainfall in the previous 24-hour period can be obtained by visiting the website http://www.intellicast.com. Go to "Current" and "Precipitation," and select the map titled "Daily." Click on the Dallas-Fort Worth area (OK-Lawton Region) on the map to obtain a contour map of precipitation depth for the Dallas-Fort Worth Metroplex for the previous 24 hours. The precipitation depth is from 1200 hours Coordinated Universal Time (UTC) of the previous day to 1200 hours UTC of the current day.

Current weather forecasts can be obtained from National Weather Service website (http://www.weather.gov/) by entering the city name or zip code.

5.1.2 Storm Event Requirements

A qualifying storm event is defined as one that satisfies the following requirements:

1.	Rainfall Volume:	0.10 inch, minimum
2.	Antecedent Dry Period:	72 hours, minimum
3.	Stream Level:	Quantifiable rise within 1 hour

Rainfall volume is the total amount of rainfall in inches within the contributing watershed of a monitoring station. The "antecedent dry period" is defined as the period prior to a storm event in which no greater than 0.10 inch of rainfall has occurred. This dry period allows build-up of constituents on the ground surface that can be washed off by the next storm event during the "first flush." The quantifiable rise in stream level within a one-hour time span will be determined by visual observation, level sensors (i.e., bubbler module), stream gauges, or other methods of determining water level. The grab sample and the first composite aliquot will be collected during the "first flush," which is defined as the 30-minute period following a quantifiable rise in the stream level.

5.2 Mobilization

The details of when the field mobilization should occur and safety issues are discussed in this section. For full details on safety precautions, consult Section 12.0.

5.2.1 When to Mobilize

Field mobilization will occur when: (1) there is rainfall at the sampler deployment location, and (2) the water level increases by a quantifiable amount at the conveyance. This information is recorded by the bubbler module and can be obtained by querying the automatic sampler unit through the cell phone modem. If an automatic sampler does not have cell phone query capability, the mobilization will be initiated based on notification from another sampler within the particular watershed where the sampler is currently located, a nearby Internet rain gauge, or weather bands tracked on radar from the Internet.

Field mobilization will be conducted 24 hours a day, on weekdays or during holidays and weekends, unless prior arrangements with NCTCOG have been made.

5.2.2 Team Assembly

The office leader may assemble multiple teams in one day. Each field team will consist of two people for safety, the field team leader and the field assistant. Field personnel will gather necessary equipment, checklists, and logbooks and travel to the site when mobilization has been authorized. Field personnel will print out the required checklists for each sampling site they are expected to visit, as well as several additional forms. These forms may be found in Appendix C. Field personnel will attempt to arrive as soon as the storm event starts in the event the sampler is not working correctly.

5.2.3 Equipment Assembly

Field personnel will go through the mobilization checklist (Appendix C) for all the equipment needed for the field trip, making sure that equipment (including the vehicles) is in good working condition and that there is sufficient gas for the field trip.

5.2.4 Equipment

The following equipment will be gathered for the collection of the storm water samples:

- Maps
- Site description and driving directions to each site
- Checklists and data forms
- Calibrated pH/temperature/specific conductivity meter
- Digital photo capturing device
- Writing instruments (pens and sharpies)
- Rain gear
- Rubberized boots
- Flashlight
- Cell phone
- Picture identification, insurance information, and contact information of office colleagues

- Water and ice for field staff (optional)
- Chain-of-custody forms (Appendix D)
- Lab sample transfer ice chest and bubble wrap
- Jumbo zip-lock freezer bags
- Ice for samples
- Extra sample containers, lids, and deep cycle battery
- Keys for shelter locks and gates, where applicable

5.2.5 Laboratory Notification

The FSO office leader will notify the laboratory of the mobilization effort and provide them with the expected number of samples.

5.2.6 Tailgate Safety Meeting

A tailgate safety meeting will be conducted prior to every monitoring event to review the anticipated site hazards. All meeting information will be placed into the project file.

5.3 Sample Retrieval

Immediately after the occurrence of a qualified sampling event, samples will be retrieved from the sampling sites. This section describes procedures upon arrival at the sampling site, including sample collection from the automatic sampler, field documentation, sampler dismantling, and transport of water samples to the laboratory for analysis.

5.3.1 Vehicle Parking and Safety

The storm water monitoring sites will be readily accessible from existing state or city street rights-of-way. FSO field personnel will not park in private driveways or on private property.

For detailed parking and safety instructions, see Section 12.0. The FSO will park the truck in such a manner as to avoid being stuck in soft off-road soils. The sampling vehicle will be locked during the sampling activities.

5.3.2 Right of Entry

FSO field personnel will carry a laminated authorization letter from NCTCOG.

5.3.3 Automatic Sampler

At each site, FSO field personnel will check the automatic sampler to verify that it is enabled and is actively taking samples. The automatic sampler contains four 1-gallon glass sample containers. The automatic sampler will fill the first sample container with 1 gallon of water immediately when triggered and also immediately place in the subsequent container a 0.5-gallon aliquot. The sampler will continue to take

0.5-gallon aliquots every 30 minutes after the initial sample for 120 minutes. The automatic sampler display will notify field personnel that sampling is complete. At the end of the programming sequence, aliquots will have been collected at 0 minutes, 30 minutes, 60 minutes, 90 minutes, and 120 minutes, for a total of three full jars and one half jar. Sample container one, or the grab sample container, will contain one 1-gallon aliquot, sample containers two and three will contain two 0.5-gallon aliquots, and sample container four will contain one 0.5-gallon aliquot. When the collection is completed, sample containers one, two, and three will each contain 1 gallon, and sample container four will contain 0.5 gallon.

Field Documentation

FSO field personnel will be responsible for documenting site conditions using the Field Condition and Sample Station checklists provided in Appendix C. The following information should be included:

- Site Details
  - Participant
  - Location
  - Name of receiving water body
- Field Conditions
  - Antecedent dry period
  - Visible construction activities observed near the site (if applicable)
- Current Field Conditions
  - Date
  - Time begin and finish sample collection activities
  - Current air temperature
  - Current cloud condition
- Precipitation Data
  - Event ID (user-provided name for the precipitation event)
  - Monitoring station for event (rain station used to gather precipitation data)
  - Storm description
  - Duration (start date and time – end date and time)
  - Total storm precipitation
  - Peak 1-hour precipitation rate
- Storm Event Collection Data
  - Flow start time (time at the beginning of the flow event, typically the time preceding a quantifiable rise in the stream depth in response to a rain event)

  - Flow end time (time at the end of a flow event, typically the time when the recession limb of the hydrograph is <2 percent of the peak or is within 10 percent of the pre-storm base flow, whichever is greater, but also may be the time preceding the next rain event from which water quality samples were not collected)
  - Peak depth (maximum depth measurement in feet obtained between the flow start time and flow end time)
  - Mean depth (the average of the depth measurements obtained between the flow start time and flow end time)

- Sample Documentation at Each Sampling Station
  - Chain-of-custody (Appendix D)
  - Sample identification number for composite sample
  - Description of the sample characteristics (e.g., turbid, clear, oil sheen)
  - Estimated water volume in sample containers
  - Number of total aliquots
  - Time first aliquot sample collected
  - Time last aliquot sample collected
- Collection of Field QA Samples
  - Sample identification number and sample type of field QA samples collected

5.3.4 Storm Water Sample Collection

The storm water samples will be collected from within the automatic sampler enclosure by removing the top half of the ISCO unit. The sample containers will be capped and removed.

Each sample bottle will be uniquely identified, labeled, and documented in the field at the time of collection. Samples will be identified with a unique series of letters and numbers that indicate the location and date that the sample was collected. The following labeling system will be used:

> **The first two characters** will indicate the participant for which the sample was collected. "AR" will be used for Arlington sites, "GA" will be used for Garland sites, "IR" will be used for Irving sites, "MS" will be used for Mesquite sites, "NT" will be used for the NTTA sites, and "PL" will be used for the Plano sites.
>
> **The next four digits** will indicate the site number and associated calendar year in which it was sampled. The first two digits will indicate the year that the sample was collected. An example for 2018 would be "18." This is followed by the site location in regard to where it is located in the watershed. All sites upstream will start with "01," mid-stream sites will be characterized as "02," and downstream "03." For example, the downstream site in Garland sampled in calendar year 2018 will be labeled "GA-1803."

The next digit will indicate the sampling season during which the sample was collected. "1" will be used for January 1 through March 31, "2" will be used for April 1 through June 30, "3" will be used for July 1 through September 30, and "4" will be used for October 1 through December 31.

The last digit will indicate the sample bottle number. "A" will be the first grab sample container, and "B" will represent bottle 2, "C" will represent bottle 3, and "D" will represent bottle 4.

To summarize, the code GA-1802-1-B would identify the second bottle container collected during the January 1 through March 31 season at the midstream station from Garland's 2018 watershed.

5.3.5 Equipment Malfunction

In the event that the automatic equipment malfunctions, a sample may be collected manually by obtaining grab samples from the stream into the four clean 1-gallon glass sample containers. Field personnel should fill the first sample container with 1 gallon of water immediately following storm flow and also immediately obtain a 0.5-gallon grab sample aliquot in the subsequent container. Field personnel should continue to take 0.5-gallon grab sample aliquots every 30 minutes after the initial sample for 120 minutes. At the end of the sampling sequence, aliquots will have been collected at 0 minutes, 30 minutes, 60 minutes, 90 minutes, and 120 minutes, for a total of three full jars and one half jar. Sample container one, or the grab sample container, will contain one 1-gallon aliquot, sample containers two and three will contain two 0.5-gallon aliquots, and sample container four will contain one 0.5-gallon aliquot. When the collection is completed, sample containers one, two, and three will each contain 1 gallon, and sample container four will contain 0.5 gallon. The grab samples will be collected using a pre-cleaned bucket that will be triple rinsed with the water to be sampled or distilled water between each sample collection. Field personnel should also note approximate water levels in a field logbook during the sampling sequence.

5.3.6 Missed and Unusable Samples

If a sample is determined to be missed or unusable for purposes of submittal to the State, the FSO will conduct a re-sampling effort. If inadequate time or insufficient rainfall occurs during the remaining permit term, a letter will be provided to NCTCOG by the FSO (and potentially the laboratory) explaining the cause of the missed sample. An additional sample will be collected during the next quarter.

5.3.7 Sampler Dismantling

The automatic sampler will be dismantled along with the battery and removed to the truck. The enclosures will remain at the sites until the last quarterly samples are collected.

5.3.8 Sample Transport

Following the collection of water samples from each site, the FSO field personnel will call the office leader at the earliest opportunity to report the sample collection status. This information will be relayed to the laboratory. FSO field personnel will transport the water quality samples preserved in ice to maintain a temperature of 4ºC to the laboratory.

5.4 Monitoring Constituents

Table 5-1 lists the constituents to be monitored and analyzed in this project.

Table 5-1 Constituents to be Monitored

Constituent	Analysis Location	Method	Detection Limit	Holding Time
E coli	Laboratory	SM9223B	10 colonies/100 mL	6 hours
Oil and grease	Laboratory	EPA 1664A	1.7 ppm	28 days
pH	Field	Probe	-	Immediately
Temperature	Field	Probe	-	Immediately
Specific Conductance	Field	Probe	-	Immediately
Biochemical Oxygen Demand (BOD)	Laboratory	SM5210B	3 ppm	48 hours
Chemical Oxygen Demand (COD)	Laboratory	SM5220D	1 ppm	28 days
Total suspended solids (TSS)	Laboratory	SM2540D	2 ppm	7 days
Total Dissolved Solids (TDS)	Laboratory	SM2540C	5 ppm	7 days
Total arsenic	Laboratory	EPA 200.7	0.0005 ppm	6 months
Total chromium	Laboratory	EPA 200.7	0.003 ppm	6 months
Total copper	Laboratory	EPA 200.7	0.002 ppm	6 months
Total lead	Laboratory	EPA 200.7	0.0005 ppm	6 months
Total zinc	Laboratory	EPA 200.7	0.005 ppm	6 months
Dissolved phosphorus	Laboratory	EPA 200.7	0.005 ppm	48 hours
Orthophosphate	Laboratory	EPA 300	0.03 ppm	48 hours
Total phosphorus	Laboratory	EPA 200.7	0.05 ppm	6 months
Ammonia Nitrogen	Laboratory	SM4500NH3B	0.05 ppm	28 days
Total nitrogen	Laboratory	SM4500-N	0.05 ppm	28 days
Nitrate Nitrogen	Laboratory	EPA 300	0.03 ppm	48 hours
Atrazine	Laboratory	EPA 619	0.0005 ppm	7 days

5.5 QA/QC Field Samples

FSO personnel will collect QA/QC samples on 10 percent of the samples collected. QA/QC checks will include the following:

Field Duplicates – Consists of obtaining a second analytical result for a scheduled sample. Duplicate results will be analyzed to monitor intra-laboratory precision of data. The laboratory will obtain duplicates from the composite containers of the auto-samplers by sub-sampling the composite volume remaining after the initial sub-sampling. The composite containers will need a minimum volume of 2½ gallons in order to collect and analyze duplicate samples. TTI Laboratories will be responsible for receiving, labeling, analyzing, documenting, and reporting these duplicates from the composite sample containers noted by FSO field staff.

Trip Blanks – Consists of de-ionized water that is carried with the FSO staff during sample collection in sample containers. They will be collected to evaluate if cross-contamination occurs during sample transport.

1-Gallon Composite Bottle Blanks – Composite container blanks will be collected by pouring de-ionized water into laboratory-cleaned 1-gallon containers. This liquid will then be sub-sampled into laboratory containers for analysis. This will test the effectiveness of decontamination procedures used by the laboratory to clean reused 1-gallon containers. FSO field staff will document the identification number of the container blank collected.

QA/QC field sample types, locations, collection schedule, and container requirements are listed in Table 5-2.

Table 5-2 QA/QC Field Sample Collection

Type	Collection Schedule	Container
Field Duplicates	10% of qualified sampling events	From composite and grab containers when volume allows
Trip Blanks	10% of qualified sampling events	1-gallon glass
Bottle Blanks	10% of qualified sampling events	1-gallon glass

The FSO will label and note the identification number of all QA/QC samples collected and the type of QA/QC samples collected.

QA/QC samples will be identified with an extension placed at the end of the sample ID. "FD" will be used to identify field duplicates, "TB" will be used to identify trip blanks, and "BB" will be used to identify bottle blanks.

6.0 Sample Handling and Documentation

This section describes the manner in which samples will be handled and tracked from the time of sample collection/retrieval to laboratory analysis.

6.1 Containers and Preservatives

All composite and grab samples will be extracted by the laboratory into sub-samples for various constituent analyses or as duplicate samples. The laboratory will place sub-samples into containers meeting the requirements of the analytical method to be performed. Additional preservatives will be added by the laboratory if required by the specific analytical method. Sample preservation is to prolong the stability of the constituents and ensure that the levels of constituents in the collected samples match as closely as possible the levels in storm water at the sample location.

6.2 Chain-of-Custody

A chain-of-custody document must accompany each sample. Samples must be under the custody of field personnel until relinquished to a representative of the laboratory. A sample is defined as being under a person's custody if any of the following conditions exist: (1) it is in their possession, (2) it is in their view after being in their possession, (3) it was in their possession and they locked it up, or (4) it is in a designated secure area.

After the samples have arrived at the laboratory, they should remain under the custody of the laboratory.

Each person receiving or relinquishing custody of the samples must sign and date the chain-of-custody when transfer of sample custody occurs. Documentation of sample possession must include the following:

- Sample description/identification
- Date and time of sample collection
- Type of sample (composite or grab)
- Preservative used
- Sample container type
- Analyses required
- Name of collector(s)
- Custody transfer signatures and dates and times of sample transfer from the field to transporters and to the laboratory
- Bill of lading or transporter tracking number (if applicable)

Preformatted chain-of-custody forms should be used to document the transfer of samples to the laboratory and the analysis to be conducted on each bottle. A sample chain-of-custody is provided in Appendix D.

7.0 Precipitation Monitoring

This section describes the manner in which precipitation amounts at the project sites will be monitored and recorded.

7.1 Rain Gauges

Tipping bucket rain gauges will be used at one site per watershed to monitor and record rainfall measurements. The tipping bucket rain gauges will be located at the most upstream sampling station within each watershed. On-line rain gauges will be used for the remainder of the sites.

7.1.1 Rain Gauge Description

The tipping bucket rain gauge to be installed at one site per watershed will provide accurate rainfall measurements from 0.01 to 22 inches per hour. The rain gauge will be mounted inside a steel cylinder and have an opening on top to collect rain. Rain falls through a screen into a funnel. From the funnel, rain collects in one side of a two-chambered plastic bucket mounted on jeweled pivots. When rain fills the chamber, the bucket tips, draining the water and exposing the other chamber to fill. When that chamber fills, the bucket tips back and the process begins anew. Each time the bucket tips from one side to the other a magnet passes over a reed switch, momentarily closing the normally open contacts. This contact closure provides a short-duration output pulse from the rain gauge for each 0.01 inch of rain. Vendor literature on the ISCO 674 rain gauge is provided in Appendix B.

7.1.2 Data Retrieval

The ISCO rain gauges will be compatible with the data logging equipment so that FSO field personnel will be able to monitor rainfall measurements and easily download recorded data during each site/sampling visit or at a minimum of once monthly. The rain gauge will connect to the data logger at each station and the data logger will store rainfall measurements. Data will be extracted from the data logger by the FSO while on-site. Data will be cleared from the data logger after it has been extracted by a prompt from the FSO.

7.1.3 Rain Gauge Maintenance

All connections from the ISCO rain gauge to the data logger should be inspected to ensure that the connections are secure. FSO field personnel should remove the rain gauge cover at least quarterly and check to see that dust, bird excrement, insect matter, or other debris has not affected the operation of the gauge. If debris is observed, the gauge should be cleaned in accordance with the vendor's recommended practices.

7.1.4 Rain Gauge Calibration

All rain gauges are factory-calibrated and adjusted. FSO personnel should not attempt to make adjustments to the jeweled pivot screws of the ISCO rain gauge as the jewel bearings may be damaged. If calibration is necessary, the equipment vendor will be contacted.

8.0 Flow and Pollutant Load Estimates

The annual pollutant loading from each watershed will be estimated for the parameters monitored during runoff events using the following equations:

Conventional Parameters:

Annual Pollutant Loading (lb) = Estimated Mean Annual Pollutant Concentration (mg/L) x 2.2046 x 10^{-6} (conversion factor) x Estimated Annual Flow Volume (L)

Bacteria:

Annual Pollutant Loading (billion colonies) = Estimated Mean Annual Pollutant Concentration (colonies/100 mL) x 1.0 x 10^{-8} (conversion factor) x Estimated Annual Flow Volume (L)

The Estimated Mean Annual Pollutant Concentration will be calculated by taking the average of the pollutant concentrations collected through in-stream storm water monitoring within each watershed per year.

The annual flow volume will be estimated using the annual precipitation and annual flow equations developed for each watershed. Sample annual flow equations are provided in Appendix E and will be updated, if necessary, prior to estimating the annual pollutant loading for the annual report. The annual precipitation will be estimated for each watershed by utilizing rain gauges located both at the monitoring site and nearby locations, where available.

The annual flow equations were developed using four methods. The first method is referred to as Reference Watershed and utilizes the regional frequency analysis approach (through U.S. Geological Survey [USGS] data obtained from nearby reference watersheds) to predict mean annual discharge using drainage area, slope, and imperviousness as definable basin characteristics. The second method is referred to as Historical Regression and utilizes mean annual discharge data from a USGS historical gage and nearby precipitation data to develop a regression equation to forecast mean annual discharge based upon precipitation amounts. The third method is referred to as Interpolation and utilizes USGS gages upstream and/or downstream of the location of interest to interpolate data collected from the gage. The fourth method is referred to as Gaged and utilizes a USGS gage located at the sampling location.

The annual load estimates for each of the parameters monitored will be calculated for the annual report. The annual load calculation as described above is based on the assumption that the dry weather portion of the annual flow volume is insignificant and that the pollutant concentrations observed during the storm events are representative of storm events occurring throughout the year.

9.0 Laboratory Analysis

9.1 Laboratory Sample Preparation

TTI Environmental Laboratory (http://www.ttilabs.com/) in Arlington [(817) 861-5322] will be alerted that weather conditions exist that may require collection of samples. This will be accomplished as soon as field crews are aware of the potential for rain so that the laboratory can prepare for receipt and analysis of samples. After sample collection, the laboratory will be informed that samples are being transported to the laboratory to allow them to have someone receive the samples for adding preservatives and to begin necessary analyses within specified holding times.

9.2 Lost or Inadequate Samples

The laboratory will notify the FSO and the FSO will notify NCTCOG immediately if a sample is lost or is determined to be inadequate according to the communication protocol specified in Section 2.5. The FSO will conduct a re-sampling effort for lost or inadequate samples according to Section 5.3.5.

9.3 Data Reports

The laboratory will submit data reports. Laboratory data reports will contain final results for blanks and recoveries, methods of analysis, detection limits, quantification levels, accuracy and precision data, MS/MSD data, laboratory method and equipment blank data, and limits of instrument calibration. In addition, special analytical problems or modifications of specified methods will be noted.

The number of significant figures reported will be consistent with the limits of uncertainty inherent in the analytical method. Consequently, most analytical results will contain no more than two significant figures. Concentrations in liquids will be expressed in terms of weight per unit volume (e.g., milligrams per liter). Reported detection limits will equal the concentration in the original matrix corresponding to the low-level instrument calibration standard after accounting for concentration, dilution, and/or extraction factors.

The laboratory will also provide:

- Hard copies of chains of custody
- Hard copies of sample receipt and log-in data
- Hard copies of analytical results
- Hard copies of quality control data
- Hard copies of narrative reports for each analytical batch that describe deviations from specifications in this scope of work and summarize QC data

10.0 Quality Assurance Project Plan

To achieve the overall monitoring objectives, data obtained during each sampling event must be accurate and precise. Additionally, samples potentially contaminated by external sources in the field or laboratory must be identified. This section defines QA procedures and requirements for the project.

10.1 Field Quality Assurance

Field QA is essential to providing accurate, representative samples of the water quality being monitored. Thus, it is important that field personnel be trained in proper sample collection procedures, including the use and programming of automatic samplers and sample handling procedures. FSO personnel collecting field samples will follow all field procedures outlined in Section 5.0.

10.2 Laboratory Quality Assurance

The FSO will utilize TTI Laboratories to analyze samples collected. The laboratory will certify the precision and accuracy of all analytical data and document all phases of sample handling, data acquisition, data transfer, report preparation, and report review.

10.2.1 Reference Materials and Reagents

Whenever possible, primary reference materials for instrument calibration, QC spikes, and performance evaluations will be obtained from the National Bureau of Standards (NBS) or the Environmental Protection Agency. In the absence of available reference materials from these organizations, other reliable sources will be sought. Such secondary reference materials may be used for these functions provided that they are traceable to an NBS standard.

Laboratory reagent quality will be sufficient to minimize or eliminate detectable concentrations of analytes in laboratory blanks. Furthermore, reagents will not contain other contaminants that interfere with sample analysis.

10.2.2 Laboratory Data Management

10.2.2.1 Laboratory Data Collection

In addition to the data recorded in field logbooks and chain-of-custody forms, data that describes sample processing will be recorded in laboratory notebooks. Laboratory notebooks will contain the following information:

- Date of processing
- Sample numbers
- Case number
- Analyses performed
- Calibration data

- QC samples
- Concentrations/dilutions required
- Instrument readings
- Special observations
- Analyst's signature

10.2.2.2 Laboratory Data Logging

TTI laboratories will utilize an established system for sample check-in, tracking of samples through the laboratory, assignment of laboratory analyses, and sample check-out. The system will provide for management review of all laboratory data before the issuance of laboratory reports. The review will be accomplished on two levels: (1) review of raw data for each analysis, and (2) review of the final results to check for consistency or agreement of the results between all parameters.

10.2.2.3 Laboratory Data Reduction

For methods that utilize a calibration curve, sample responses will be applied to the linear regression line to obtain an initial raw result that will be factored into equations to estimate the concentration in the original sample. Rounding will only be performed after the final result has been obtained to minimize rounding errors. Copies of the raw data and the calculations used to generate the final results will be retained on file to allow reconstruction of the data reduction process at a later date if necessary.

At the completion of a set of analyses, all calculations will be completed and checked by the analyst. The associated QC data will be entered onto QC charts. If all data is acceptable, the data summaries will be submitted to the laboratory project manager for review. If QC samples do not meet acceptance criteria, the appropriate laboratory project manager will be notified, and corrective action will be taken as specified in Section 10.2.3.

10.2.2.4 Laboratory Data Review

System reviews will be performed at all levels. The individual analyst will constantly review the quality of data through calibration checks, QC sample results, and performance evaluation samples. These reviews will be performed prior to submission to the laboratory project manager.

The laboratory project manager will review data for consistency and reasonableness with other data and will determine if QA/QC program requirements have been satisfied. Selected hard copy output of data, such as chromatograms and spectra, will be reviewed to verify that results were interpreted correctly. Unusual or unexpected results will be reviewed and a resolution will be made as to whether the analysis should be repeated. In addition, the laboratory project manager will recalculate selected results to verify the calculation procedure.

10.2.3 Corrective Actions

An analysis will be considered to be out of control when it does not conform to the QA/QC protocols specified by this document, applicable methods, or standard operating procedures. When an analysis is out of control, the analyst who identifies the problem will document the occurrence and notify the laboratory project manager. The analyst, working with the laboratory project manager, will determine the cause of the problem and take appropriate corrective action. Analysis may not resume until the problem has been corrected. Restoration of analytical control will be demonstrated by generating satisfactory calibration and/or QC sample data.

Data generated concurrently with an out-of-control system will be evaluated for usability in light of the nature of the deficiency. If the deficiency does not impair the usability of the results, the data will be reported and the deficiency noted in the laboratory data report (e.g., a constituent is detected in a laboratory blank but not in sample analyses). Where sample results are impaired, the FSO project manager will be notified. After the error has been corrected, the analysis will be rerun and the data can be reported. The laboratory project manager will outline the error and the corrective action in a QA report. If the cause of the error cannot be identified, the laboratory project manager will summarize the procedures and QA/QC used to analyze the sample and provide a statement of validity for the sample results.

Problems encountered during the field activities will be reported by the designated FSO field staff as soon after discovery as possible. The Atkins project manager will be responsible for ensuring that corrective actions produce satisfactory results in a timely manner. Outcomes of those actions and their effect or potential effect on the data will be reported to Atkins and NCTCOG.

Results of performance or systems audits or internal QC analyses may trigger corrective action within the designated laboratory and Atkins project team. However, it is generally the responsibility of the laboratory analyst or Atkins field personnel to initiate laboratory or field corrective actions, respectively.

11.0 Post-Sampling Activities

11.1 Equipment Maintenance

The FSO will perform maintenance activities after each mobilization. The FSO will clean field equipment and store in an accessible location at one of the FSO's storage facilities. Equipment cleaning procedures are described in the Teledyne ISCO 6712 Portable Samplers Installation and Operation Guide available at www.isco.com. Distilled water should be used for the equipment cleaning. All sample containers will be cleaned by the laboratory. Prior to the next quarter of sampling, the equipment will be returned to the site. Routine maintenance will be performed on the equipment, including replacing the auto-sampler composite containers and preparing the sampling stations for the next storm event. The shelter integrity will also be checked. The maintenance checklist in Appendix C will be used to guide and record the maintenance activities.

11.2 Data Management

The FSO will be responsible for the data management that will cover data storage systems, data handling, data validation and analysis, and data reporting.

An electronic data deliverable (EDD) will be established to store digital information such as laboratory analytical data and field recorded measurements. Hard-copy data from field sheets, log books, and computer outputs will be scanned as an electronic copy for backup.

The FSO will be responsible for the data validation that will be performed on field and laboratory data prior to submittal to the NCTCOG. Reports received from the laboratory will be reviewed for consistency and completeness. Reports will also be checked for the requested analyses and QA activities performed by the laboratory. Corrective actions will be initiated if inconsistencies or problems are encountered with submitted reports.

A data reporting schedule will be developed with NCTCOG. All validated sample collection data will be submitted to the NCTCOG in a pre-approved database or report format. Data will be reported in both hard copy and electronic formats. The data will also be input into the regional monitoring program database.

11.3 Floods and Retrieval of Equipment

FSO personnel will be aware of flood warnings and watches as posted by the National Weather Service. If flooding is anticipated, the FSO will make every effort to travel to the sampling equipment and remove it from watersheds where the flooding is expected. If the equipment is submerged or dangerous conditions threaten field personnel, the equipment may be abandoned and retrieved when the conditions subside.

11.4 Redeployment of Equipment

The automatic samplers will be serviced by the FSO and redeployed prior to each sampling quarter. The samplers will be serviced following the guidelines established by Teledyne Isco (2013 and 2016). These guides are available for download at www.isco.com. After collection of the last quarterly sample, all equipment will be removed and returned to the storage facility for cleaning and repairs, as necessary, before deploying to new sampling locations.

12.0 Health and Safety

This section is provided to assist field personnel in the safe performance of water quality data collection. Field work requires an awareness of potential hazards and knowledge of basic safety procedures. Atkins will provide health and safety documentation for this project to field personnel. Prior to the start of any work activity conducted by Atkins, all personnel participating in the work will review the applicable documentation to ensure full understanding of the job task, its associated hazards, and all applicable mitigation measures. All personnel must acknowledge this understanding and their intent to fully comply with all health and safety requirements by signing the provided Acknowledgement page.

12.1 Basic Safety Preparation

Basic preparations will be routine before every sampling activity. At a minimum, a trip plan should be completed for each field trip and left at a designated location in each consultant's office. The trip plan should include the following information:

- Field trip participants
- Departure and return times
- Contact phone numbers
- Basic itinerary, including where and when sampling will be performed

Field work must be done in pairs. FSO field staff will consider carrying the following safety equipment during sample collection activities:

- Rubber boots
- Safety vests, hard hats, and steel-toed shoes
- Amber warning light for vehicle
- Reflective traffic cones
- Bug repellent
- First aid kit
- Flashlight and spare batteries
- Cellular phone
- Rain gear
- Hat/sunscreen/sunglasses
- Drinking water/sports drinks
- Tool box with basic tools
- Latex gloves
- Antibacterial soap or hand cleaner
- Distilled water, 1 gallon

- List of emergency phone numbers/office contacts

The FSO will carry a packet of general safety information in each vehicle that contains the following materials:

- Emergency phone numbers
- Picture identification cards, insurance information, and project identification sheets
- Laminated work authorization from the NCTCOG
- Locations of emergency facilities (hospitals and police and fire departments)

12.2 Hazards

Atkins has developed and continually updates job safety instructions for known hazards and activities. Atkins will issue instructions to field personnel and provide updated instructions as necessary as part of the health and safety documentation provided to field personnel.

12.3 First Aid Equipment and Supplies

A first aid kit will be located within the vehicle located at the project sites during sample collection. The first aid kit must include at a minimum: snakebite kit, potable distilled water, bandages, scissors or knife, antiseptic, bee sting kit, and allergic reaction to insect bite kit.

Other required procedures to reduce injury include:

- Confined entry will not be conducted.
- Stream reaches must not be entered below the water level during sample collection, during a rainstorm, or when rain is imminent. FSO field staff must be aware of flash flood warnings and remain in contact with FSO office staff.
- Appropriate lighting equipment will be carried to illuminate potential hazards. The stream banks may be muddy and slippery.
- Care must be taken when handling the heavy composite and grab containers.

12.4 Selection of PPE

The selection of the personal protective equipment (PPE) will be done per site/field activity and after a thorough evaluation of the hazards involved at the site during each phase of the operation.

Recommended and required PPE is comprised of the following:

- Latex gloves when handling storm water samples
- Raingear
- Rubber boots

- Safety vest – reflective
- Coveralls or work clothing
- Work gloves

12.5 Nearest Hospital Information

Locations and information for the nearest hospitals for the various sampling sites are located in Appendix F.

12.6 Emergency Contact Information

Emergency contacts are listed below:

FIRE*	9-1-1
POLICE*	9-1-1
NATIONAL SPILL RESPONSE CENTER	(800) 424-8802
HOSPITAL	See Appendix F
AMBULANCE*	9-1-1

* Local Area Police and Fire will respond to a 9-1-1 call.

13.0 References

North Central Texas Council of Governments (NCTCOG). 2017. The North Central Texas Regional Wet Weather Characterization Plan Proposal for the Fourth Permit Term. 2017. Arlington, Texas.

National Weather Service Weather Forecast Office (NWSWFO). 2011. *National Weather Service Weather Forecast Office Dallas/Fort Worth, TX.* http://www.srh.noaa.gov/fwd/.

Teledyne Isco. 2016. 6712 Portable Samplers Installation and Operation Guide. Revision KK. February 2016. Lincoln, NE.

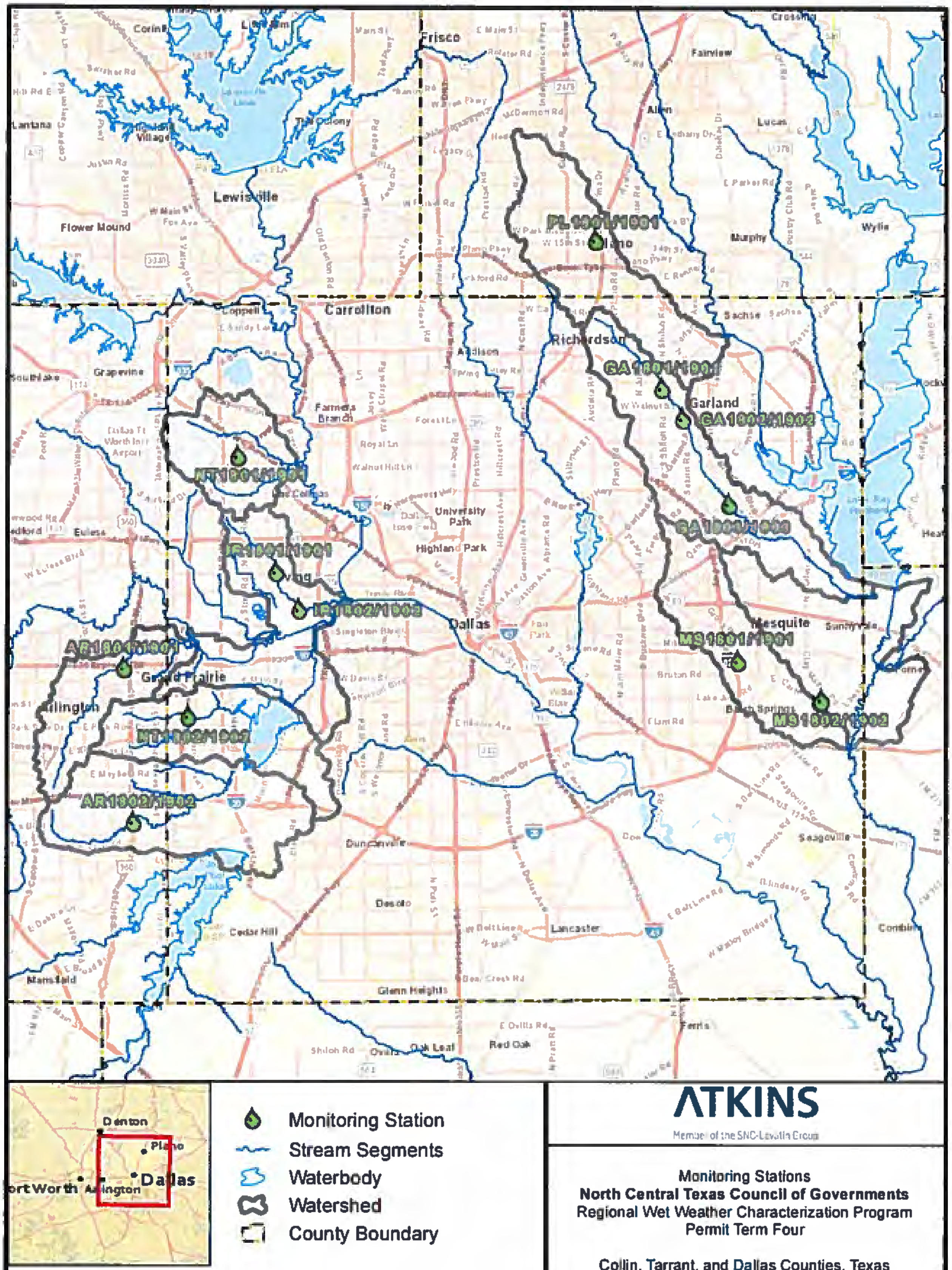
Teledyne Isco. 2013. 730 Bubbler Module Installation and Operation Guide. Revision M. October 2013. Lincoln, NE.

Appendix A

Sampling Locations

Monitoring Station Map

2018-2019



Datum NAD 1983
Projection State Plane
Texas North Central
Units Feet
Basemap ESRI Streets

ATKINS
Member of the SNC-Lavalin Group

Monitoring Stations
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Permit Term Four

Collin, Tarrant, and Dallas Counties, Texas

Job No.: 100060260	Scale: 1 " = 6 miles
Prepared By ATKINS/WHIT6392	Date: May 01, 2018

N:\Clients\M_NNCTCOG\100060260\geo\figs\sampling.mxd

Esri, DeLorme, HERE, USGS, Intermap, iPC, NRCAN, METI, TomTom World Street Map March 2014
1:379,900, generated by Atkins, using ArcMap <http://server.arcgisonline.com/ArcGIS/rest/services/World_Street_Map/MapServer> (01 May 2018)

City of Arlington

2018 - 2019 Sites

Johnson Creek and Fish Creek – Mountain Creek Lake Watersheds

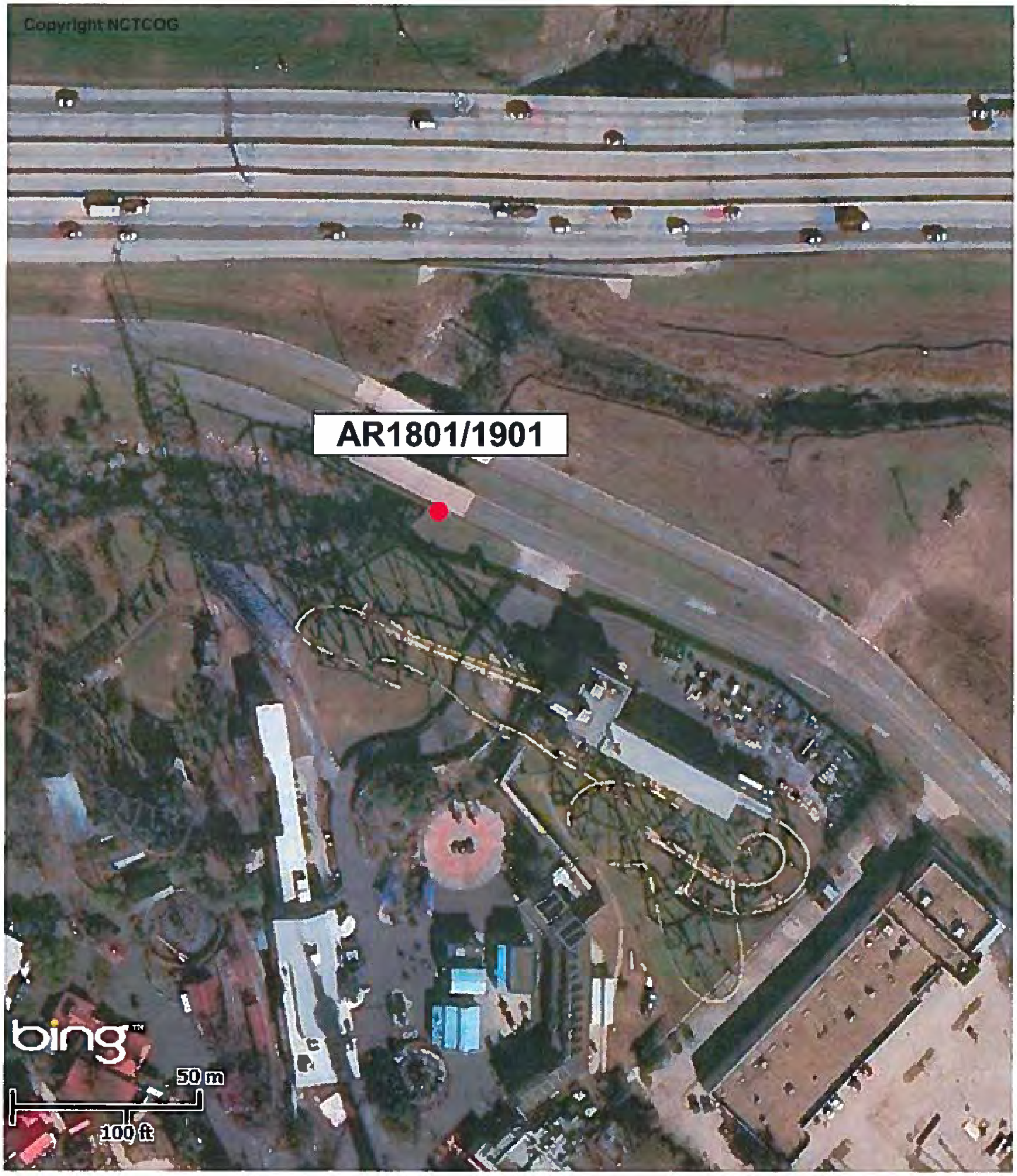
Johnson Creek at Six Flags

AR1801/1901

North Central Texas
Council of Governments

DFWMaps.com

N



North Central Texas
Council of Governments

DFWMaps.com

N

Fish Creek at SH360

AR1802/1902

North Central Texas
Council of Governments

DFWMaps.com

DISCLAIMER
This data has been compiled for NCTCOG.
Various official and unofficial sources were used to gather this information. Every effort was made to ensure the accuracy of this data, however, no guarantee is given or implied as to the accuracy of said data.

N

North Central Texas
Council of Governments

DFWMaps.com

N

Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/20/17 Time: 09:49

Location Name/Number: ARL 003 - Johnson Creek @ Copeland

Nearest Cross Street/Location Description: East Copeland + Six Flags Drive

Entity (Circle One): [✓ Arlington] Garland Irving Mesquite NTTA Plano

GPS Latitude/Longitude: 32°45'31.72"N, 97°04'01.41" W

Receiving Water: West Fork Trinity

Data for locating automated samplers:

Ease of Installation – Native or Existing Location / Bench – [✓ Need to construct Location / Platform / Base]

Describe: Flat surface present, slight leveling needed

Ease of channel/sample area access and safety: – Describe either [✓ YES] or NO

Describe: Easy access to box location. Tube maintanance more difficult. Almost vertical rip-rap to water surface.

Conveyance Information:

Conveyance Type & Size (Example: [✓ Unlined Channel], Grassy Swale, Open Channel Chute, etc.)

Describe: Rip-rap on east bank (right bank) + west bank.

Vegetative Cover – High – [✓ Medium] – Low

Describe: Trees growing out of rip-rap. Grass area well-maintained

Visibility from the Right-of-Way – High Visibility – [✓ Low Visibility] – None

Describe: Set below bridge elevation, low visibility from road

Public Access – [✓ Yes] – No

Describe: At gate to Six Flags. (employee gate)

Evidence of Public Use – Yes – No (Circle all that apply, or describe)

Cans – [✓ Bottles] – Paper – Food Products – Rubble – Wood – Brush – Graffiti – Transient Community

Describe: Minimal debris

Evidence of Normal Surface Water Elevation – [✓ Yes] – No – Depth >2' inches/[✓ feet]

Describe:

Perennial Flow Presence – High – [✓ Medium] – Low – Depth >2' inches/[✓ feet]

Describe:

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water ~20'
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample ~20'
(Recommended to be less than 25 feet)

Other Site Features of Importance: Road construction of Copeland (~~East~~ westbound). East bound access only. SWP3 BMP's in place

Tree and branch removal needed.

Notes:

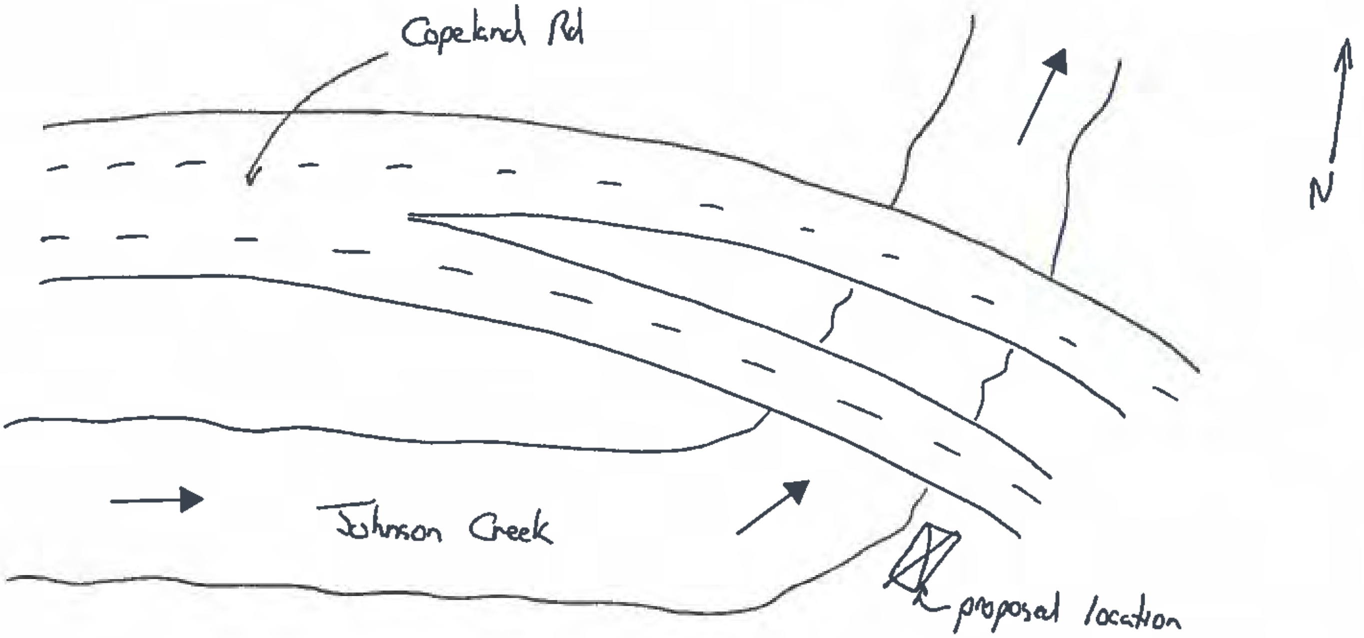
Provide Site Visit Attendee Name(s) and Company/Entity:

Brigette Gibson – City of Arlington

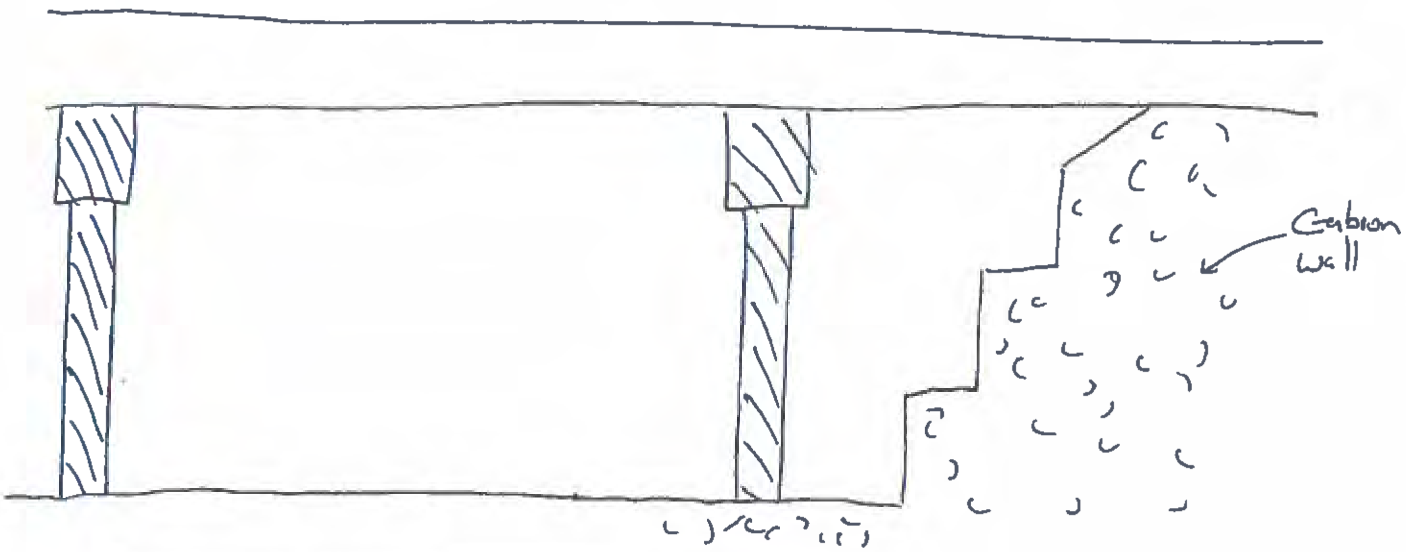
Ryan Deal – FNI

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: Upstream / [✓ Downstream] (Circle One)

Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/20/17 Time: 11:06

Location Name/Number: ARL-004 – Fish Creek @ 360

Nearest Cross Street/Location Description: Kingswood Blvd./SE Green Oaks Blvd. + SH-360

Entity (Circle One): [✓ Arlington] Garland Irving Mesquite NTTA Plano

GPS Latitude/Longitude: 32°39'44.47"N, 97°03'41.31" W

Receiving Water: West Fork Trinity

Data for locating automated samplers:

Ease of Installation – Native or Existing Location / Bench [✓ – Need to construct Location / Platform / Base]

Describe: Brush clearing needed, somewhat level ground

Ease of channel/sample area access and safety: – Describe either [✓ YES] or NO

Describe: Access off of SE Green Oaks Blvd. Next to Trinity Trail system

Conveyance Information:

RD

Conveyance Type & Size (Example: [✓ ~~Unlined~~ Channel,] Grassy Swale, Open Channel Chute, etc.)

Describe: ~~Natural stream channel~~ Lined channel (concrete)

Vegetative Cover – [✓ High] – Medium – Low

Describe: Good riparian buffer

Visibility from the Right-of-Way [✓ – High Visibility] [✓ – Low Visibility] – None

Describe: Low from roadway, high from trail

Public Access – [✓ Yes] – No

Describe: Trail system

Evidence of Public Use [✓ Yes] ~ No (Circle all that apply, or describe)

[✓ Cans] ~ [✓ Bottles] ~ [✓ Paper] ~ [✓ Food Products] ~ Rubble ~ Wood ~ [✓ Brush] ~ Graffiti ~ Transient Community

Describe: In channel, does not appear to be from trail

Evidence of Normal Surface Water Elevation ~ [✓ Yes] ~ No ~ Depth <2" [✓ inches]/feet

Describe:

Perennial Flow Presence ~ High ~ Medium ~ [✓ Low] ~ Depth <2" [✓ inches]/feet

Describe:

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water ~35'
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample ~6'
(Recommended to be less than 25 feet)

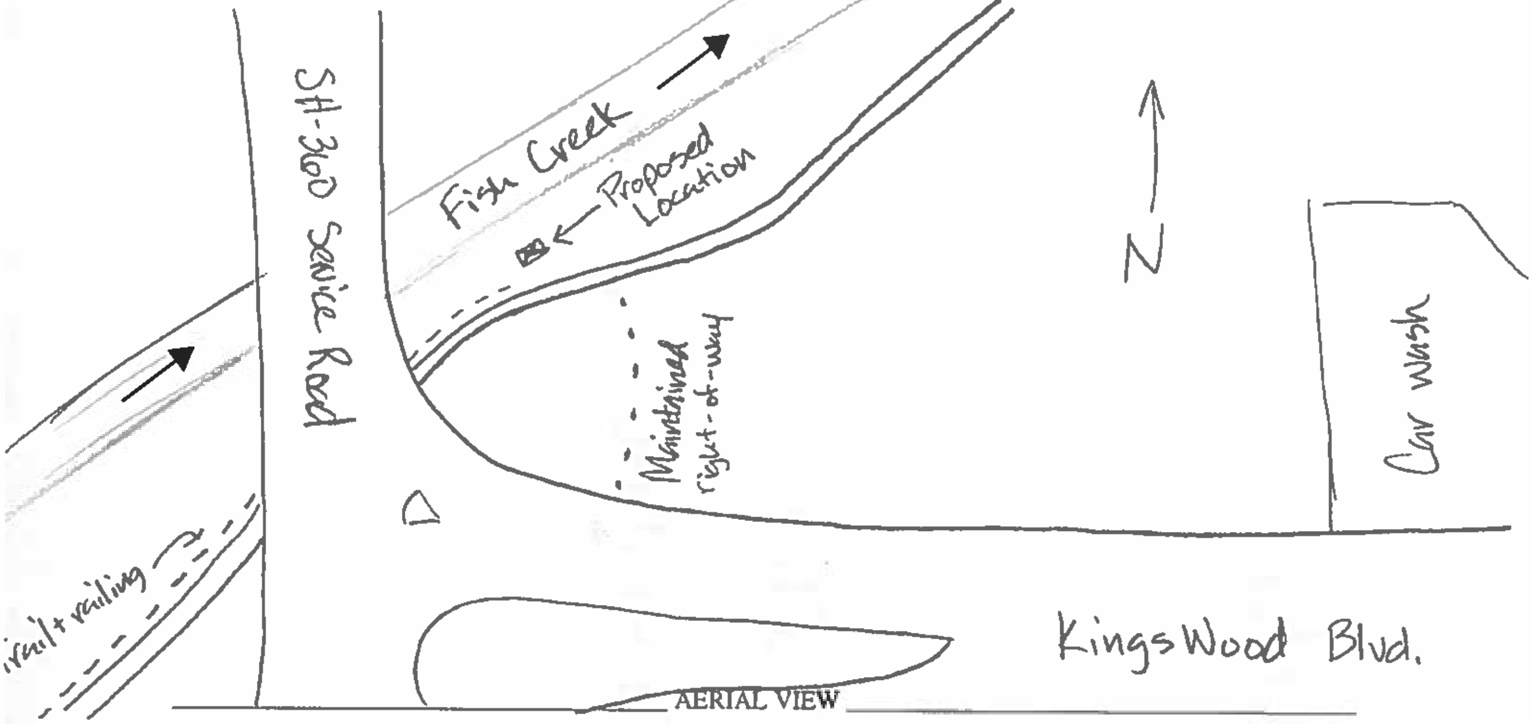
Other Site Features of Importance: Heavy brush, trail access. Vandalism likely

Notes:

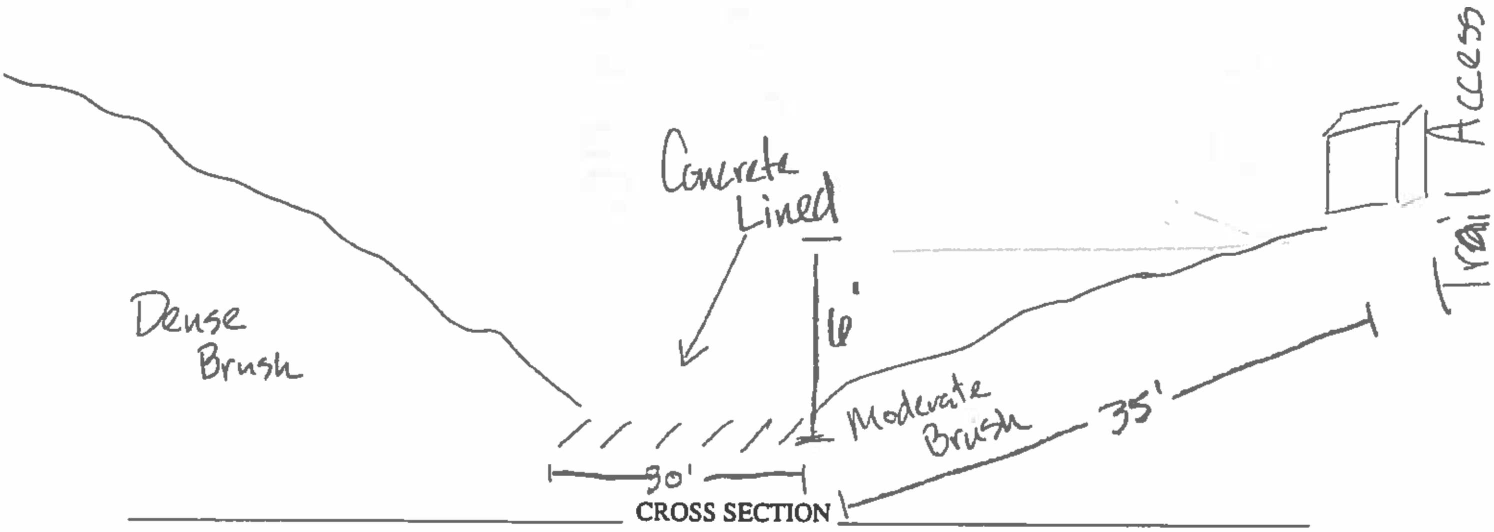
Provide Site Visit Attendee Name(s) and Company/Entity:
Brigette Gibson - City of Arlington
Ryan Deal - FNI

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: Upstream / [✓ Downstream] (Circle One)

City of Garland

2018 - 2019 Sites

Duck Creek Watershed

Duck Creek at Shiloh Bridge

GA1801/1901

North Central Texas
Council of Governments

DFWMaps.com

N

North Central Texas
Council of Governments

DFWMaps.com

N

Duck Creek between Forest North and South

GA1802/1902

North Central Texas Council of Governments

DFWMaps.com

DISCLAIMER

N

DFWMaps.com

DISCLAIMER
This data has been compiled for NCTCOG.
Various official and unofficial sources were used to gather this information. Every effort was made to ensure the accuracy of this data, however, no guarantee is given or implied as to the accuracy of said data.

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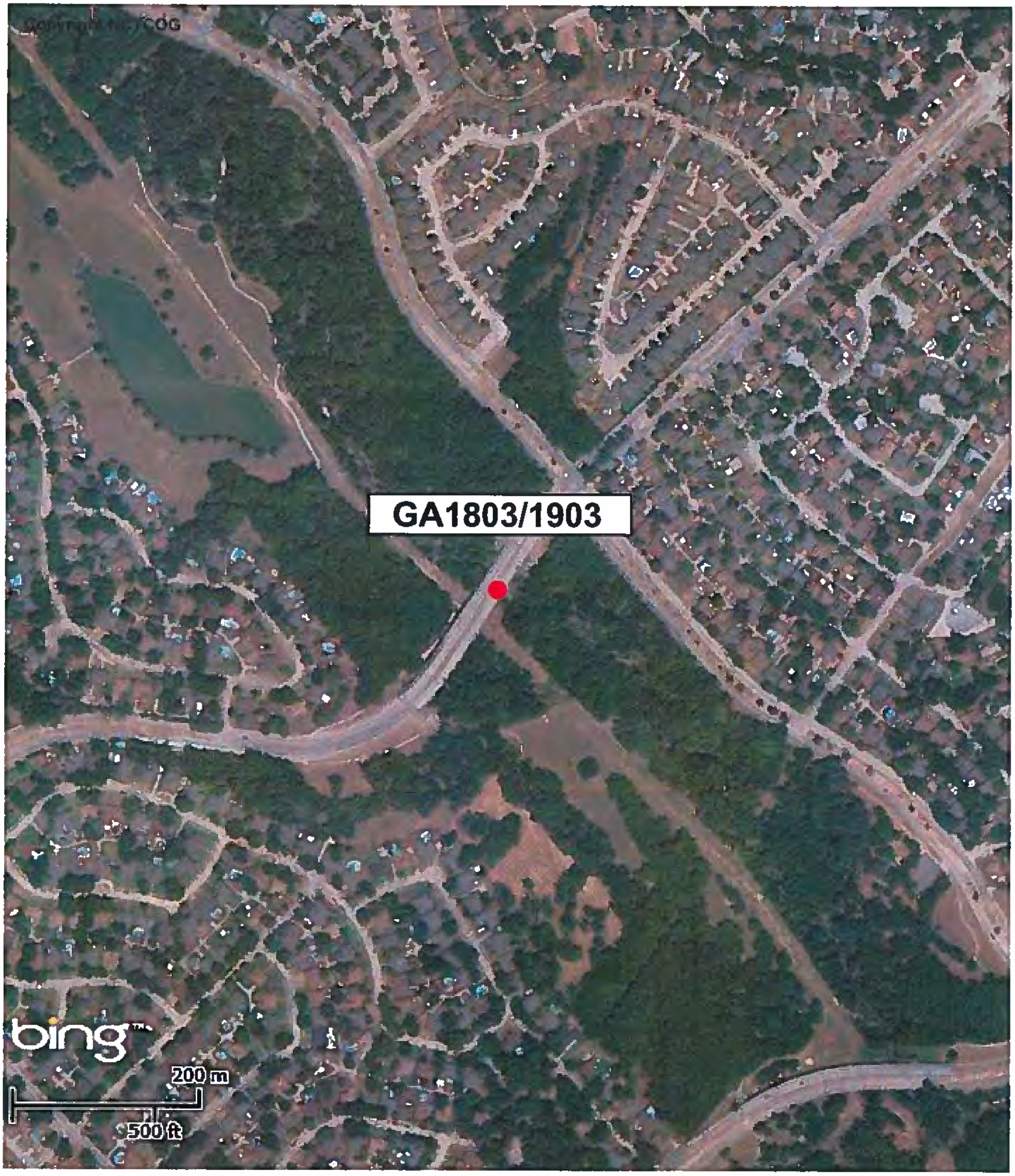
North Central Texas
Council of Governments

Duck Creek under La Prada Bridge

GA1803/1903



North Central Texas
Council of Governments

DFWMaps.com

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North Central Texas
Council of Governments

DFWMaps.com

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Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/15/17 Time: 9:00 AM

Location Name/Number: Site F Shiloh GA 01 A

Nearest Cross Street/Location Description: N. Shiloh Road

Entity (Circle One): Arlington [✓ Garland] Irving Mesquite NTTA Plano

GPS Latitude/Longitude: 32.928232°, -96.665222°

Receiving Water: Duck Creek

Data for locating automated samplers:

Ease of Installation [✓ Native or Existing Location / Bench] Need to construct Location / Platform / Base

Describe: Level area above rock ledges from previous shelter

Ease of channel/sample area access and safety: Describe either [✓ YES] or NO

Describe: Walk next to roadway; park on west side of Shiloh, south of bridge on small road in grass

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: Rock channel, unlined, natural, minimal sediment deposits; channel not expected to shift

Vegetative Cover [✓ High] Medium Low

Describe: Lots of vegetation on top of bank; some clearing required

Visibility from the Right-of-Way High Visibility [✓ Low Visibility] None

Describe: SW side of bridge

Public Access Yes [✓ No]

Describe: Only from bridge; very little public use

Shiloh

Evidence of Public Use [✓ Yes] No (Circle all that apply, or describe)

[✓ Cans] [✓ Bottles] [✓ Paper] Food Products Rubble [✓ Wood] Brush Graffiti Transient Community

Describe: Some trash located on top of bank

Evidence of Normal Surface Water Elevation [✓ Yes] No Depth ~3 [✓ inches]/feet

Describe: Water about 3 inches deep on bottom of concrete apron

Perennial Flow Presence High [✓ Medium] Low Depth ~3 [✓ inches]/feet

Describe: Moderate flow; riffles upstream and downstream

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water 25 ft
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample 24 ft
(Recommended to be less than 25 feet)

Other Site Features of Importance: Kimley-Horn development adjacent
Plans submitted to City for subdivision.

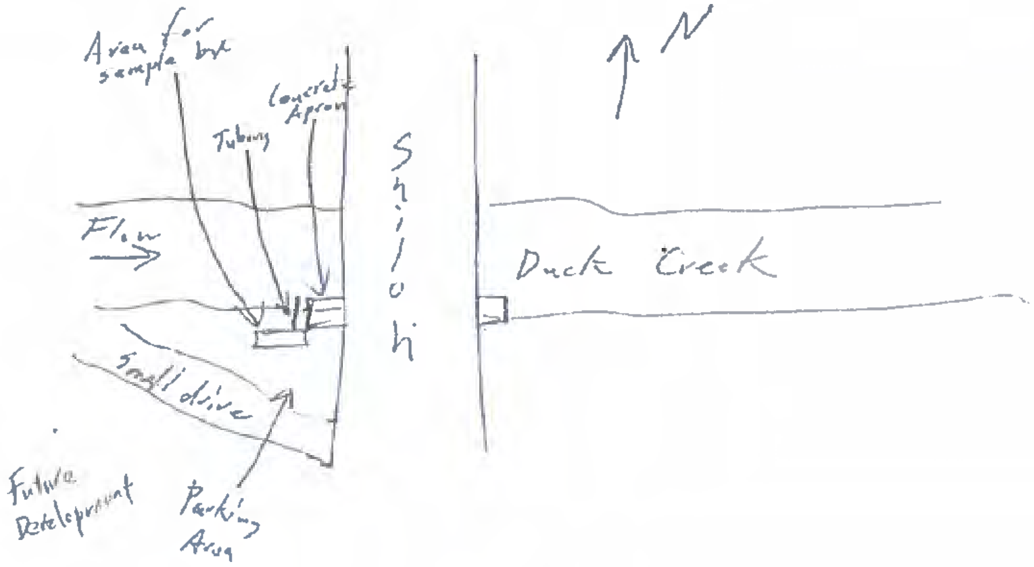
Notes:

Provide Site Visit Attendee Name(s) and Company/Entity:

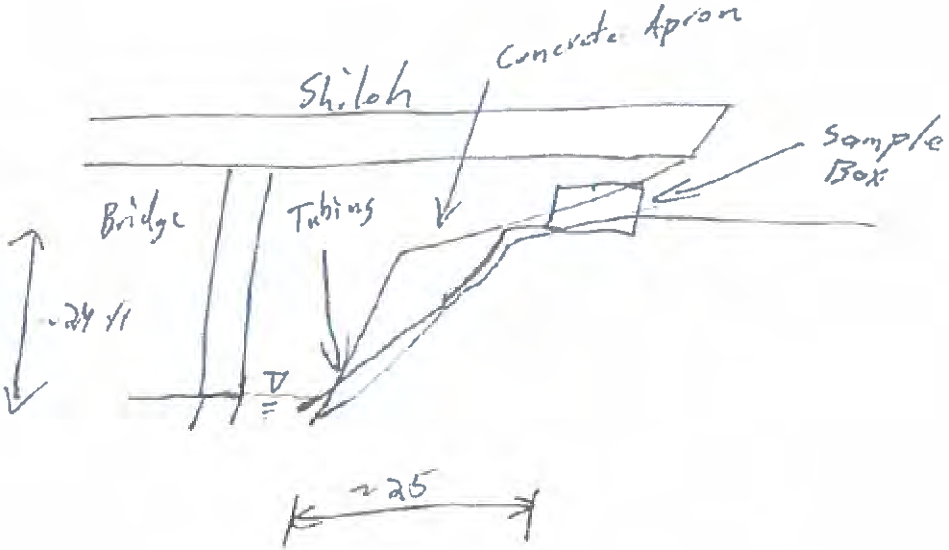
Wayne Wolverton - City of ~~Plano~~ Garland
Mike Wilson - City of ~~Plano~~ Garland
Chad Richards - Atkins

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: Upstream / [✓ Downstream] (Circle One)

Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/15/17 Time: 9:15 AM

Location Name/Number: Site 6 Forest Lane GA 02A

Nearest Cross Street/Location Description: S. Forest Lane

Entity (Circle One): Arlington [✓ Garland] Irving Mesquite NTTA Plano

GPS Latitude/Longitude: 32.909388° / -96.650556°

Receiving Water: Duck Creek

Data for locating automated samplers:

Ease of Installation [✓ Native or Existing Location] / Bench Need to construct Location / Platform / Base

Describe: Top of bank level from previous installation

Ease of channel/sample area access and safety: Describe either [✓ YES] or NO

Describe: Drive onto grass area off of Kevin Street b/w Forest Lane bridges

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: Rock bottom; earthen sides; gradual side slope on west bank

Vegetative Cover High Medium [✓ Low]

Describe: Low on west bank; medium near channel bottom

Visibility from the Right-of-Way [✓ High Visibility] Low Visibility None

Describe: Located b/w bridges in open area

Public Access [✓ Yes] No

Describe: May get pedestrian traffic crossing b/w Forest Lane North and South

Forest Lane

Evidence of Public Use Yes [✓ No] (Circle all that apply, or describe)

Cans Bottles Paper Food Products Rubble Wood Brush Graffiti Transient Community

Describe: Very little trash; some remnants of old sampling lines

Evidence of Normal Surface Water Elevation [✓ Yes] No Depth 3 [✓ inches]/feet

Describe: Mostly shallow on west side

Perennial Flow Presence High [✓ Medium] Low Depth 3 [✓ inches]/feet

Describe: Moderate flow present; channel very wide; mostly shallow with few pools

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water 30 ft
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample 25 ft
(Recommended to be less than 25 feet) Almost TOB

Other Site Features of Importance: Rock channel bottom with minimal sediment deposits; wide channel; flow stream not expected to shift

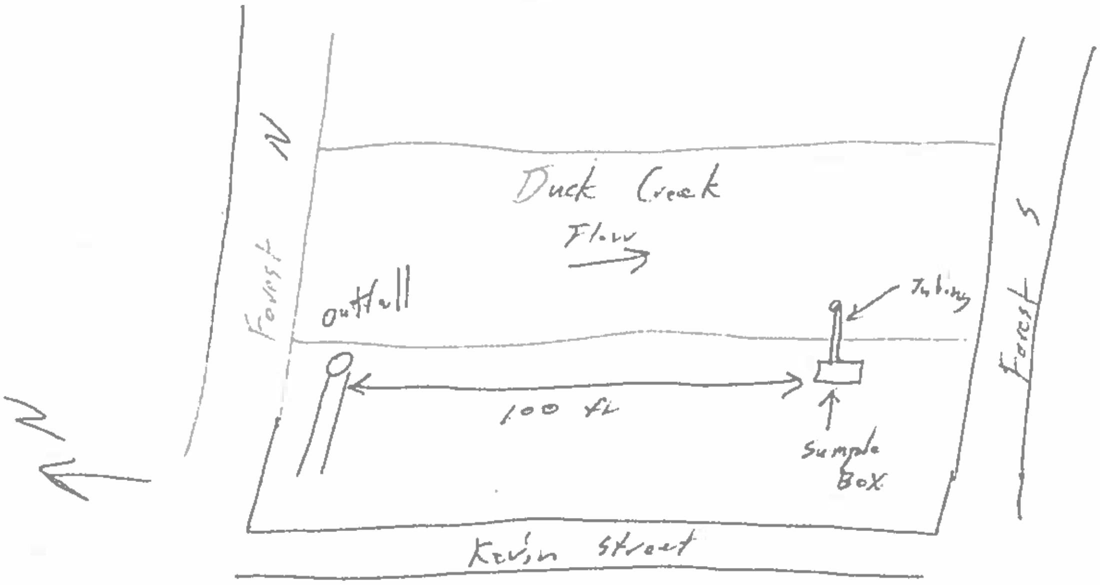
Notes: Previous installation near manhole

Provide Site Visit Attendee Name(s) and Company/Entity:

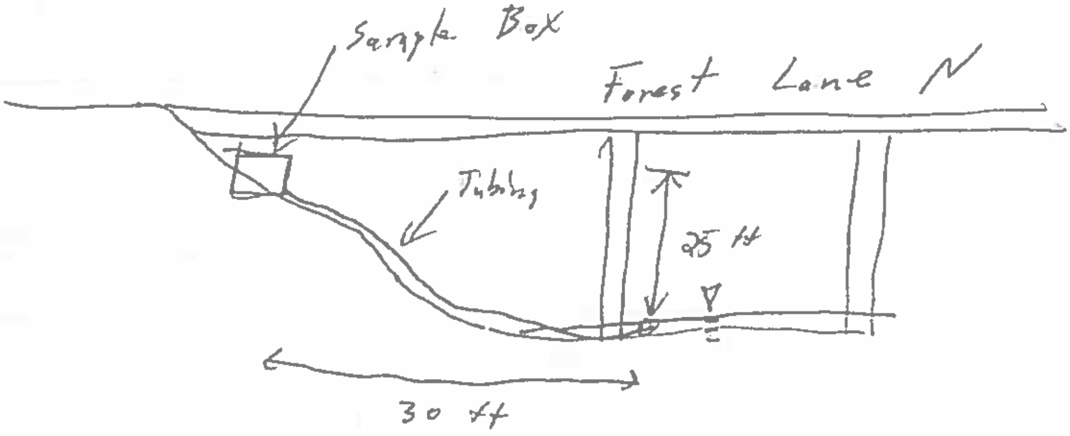
Wayne Wolverton - City of Garland
Mike Wilson - City of Garland
Chad Richards - Atkins

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: [✓ Upstream] / Downstream (Circle One)

Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/15/17 Time: 9:50

Location Name/Number: Site H La Prada GA 03 A

Nearest Cross Street/Location Description: La Prada Drive

Entity (Circle One): Arlington [✓ Garland] Irving Mesquite NTTA Plano

GPS Latitude/Longitude: 32.855468°, -96.616894°

Receiving Water: Duck Creek

Data for locating automated samplers:

Ease of Installation [✓ Native or Existing Location / Bench] Need to construct Location / Platform / Base

Describe: Secure to top of bank on gabions

Ease of channel/sample area access and safety: Describe either [✓ YES] or NO

Describe: Access down sidewalk and gravel road; do not park under bridge when wet

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: Unlined channel with gravel bottom

Vegetative Cover High Medium [✓ Low]

Describe: None under bridge; medium on sides of bridge

Visibility from the Right-of-Way High Visibility [✓ Low Visibility] None

Describe: Visible from walking/bike trails

Public Access [✓ Yes] No

Describe: Trails cross by area

La Prada

Evidence of Public Use [✓ Yes] No (Circle all that apply, or describe)

[✓ Cans] [✓ Bottles] [✓ Paper] Food Products [✓ Rubble] Wood Brush [✓ Graffiti] Transient Community

Describe: Evidence of use under bridge

Evidence of Normal Surface Water Elevation [✓ Yes] No Depth ~3 inches/[✓ feet]

Describe: Deep pool on west side of bridge, becomes shallower under bridge and goes to another deep pool downstream

Perennial Flow Presence [✓ High] Medium Low Depth ~3 inches/[✓ feet]

Describe: Moderate to high flow through channel

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water 25 ft
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample 20 ft
(Recommended to be less than 25 feet)

Other Site Features of Importance: Place sampler on upstream side to run conduit to pool

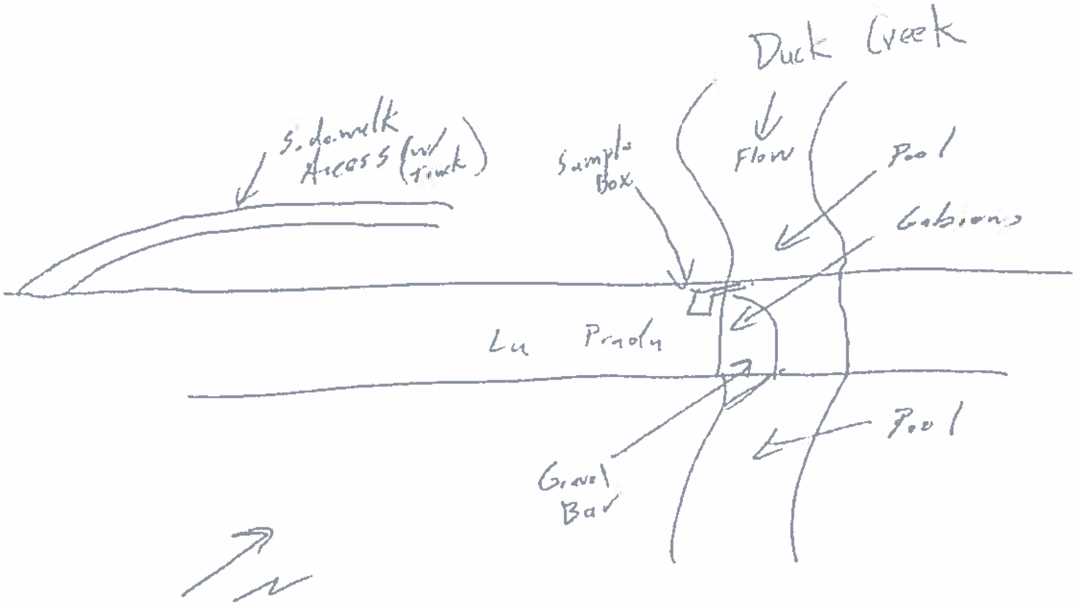
Notes:

Provide Site Visit Attendee Name(s) and Company/Entity:

Chad Richards - Atkins
Mike Wilson - City of ~~[illegible]~~ Garland
Wayne Wolverton - City of ~~[illegible]~~ Garland

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



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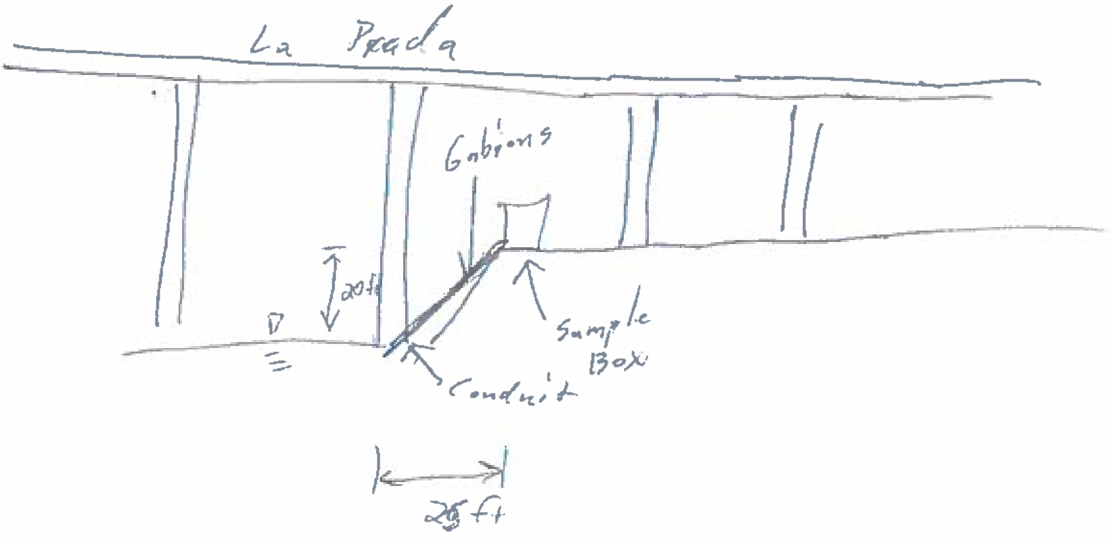


CROSS SECTION

Facing: Upstream / [✓ Downstream] (Circle One)

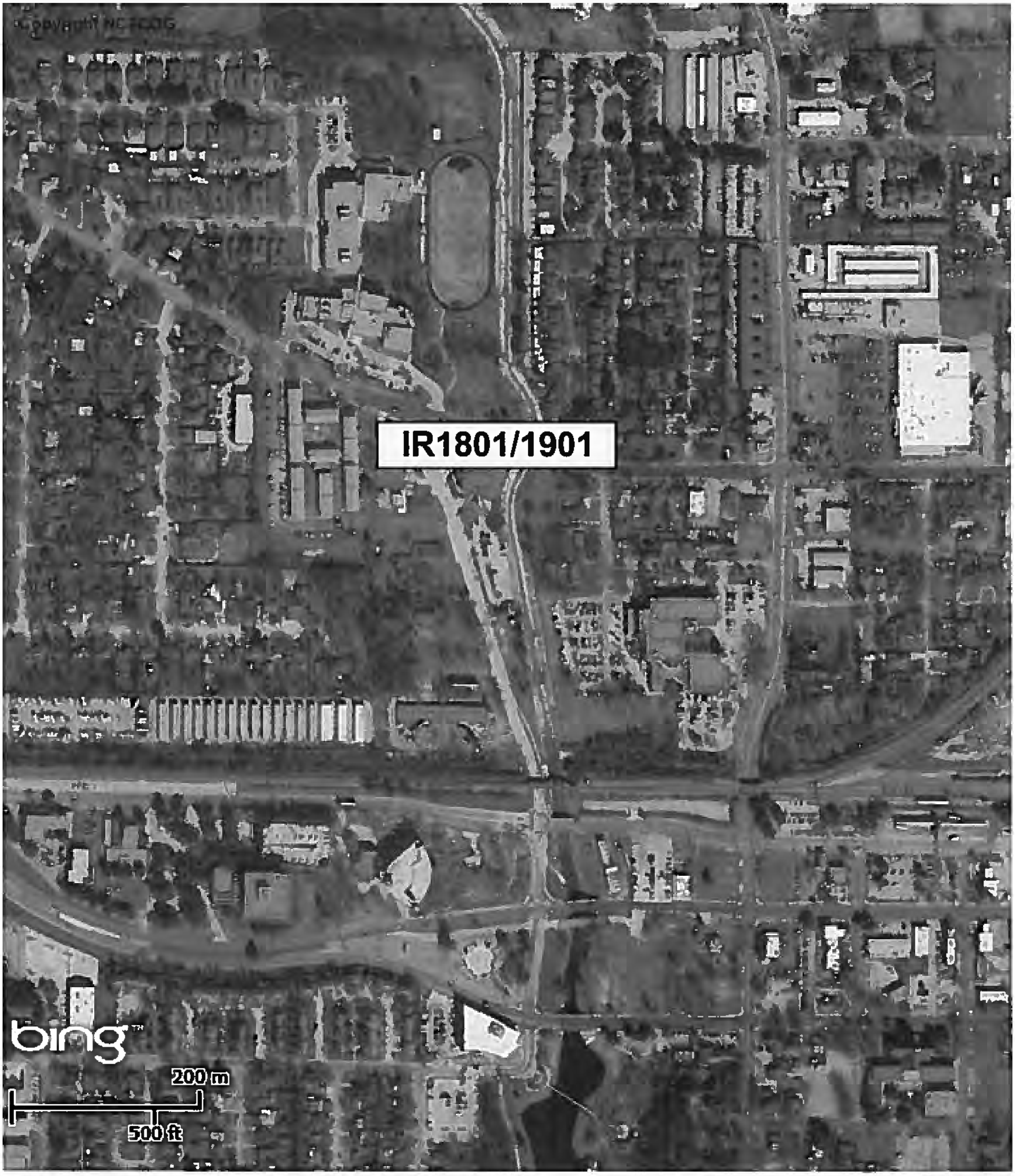
City of Irving

2018 - 2019 Sites

Delaware Creek – West Fork Trinity Watershed

Delaware Creek at Sowers Road

IR1801/1901



North Central Texas
Council of Governments

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Council of Governments

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Delaware Creek at Oakdale

IR1802/1902

North Central Texas
Council of Governments

DFWMaps.com

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North Central Texas
Council of Governments

DFWMaps.com

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Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/13/17 Time: 10:01

Location Name/Number: Delaware Alternative 1 - Sowers Road

Nearest Cross Street/Location Description:

Entity (Circle One): Arlington Garland [✓ Irving] Mesquite NTTA Plano

GPS Latitude/Longitude: 32.818N , 96.953N

Receiving Water: West Fork Trinity

Data for locating automated samplers:

Ease of Installation [✓ ~ Native or Existing Location / Bench] ~ Need to construct Location / Platform / Base

Describe: Well maintained grass cover

Ease of channel/sample area access and safety: ~ Describe either [✓ YES] or NO

Describe: Parking lot access & limited veg.

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: Concrete lined channel

Vegetative Cover ~ High ~ Medium ~ [✓ Low]

Describe: No veg in channel

Visibility from the Right-of-Way ~ [✓ High Visibility] ~ Low Visibility ~ None

Describe: Easily seen from Sowers Road

Public Access ~ [✓ Yes] ~ No

Describe: Parking lot adjacent to site

Evidence of Public Use ~ Yes ~ [✓ No] (Circle all that apply, or describe)

Cans ~ Bottles ~ Paper ~ Food Products ~ Rubble ~ Wood ~ Brush ~ Graffiti ~ Transient Community

Describe: ______________________________

____

Evidence of Normal Surface Water Elevation ~ [✓ Yes] ~ No ~ Depth <6" [✓ inches]/feet

Describe: ______________________________

____

Perennial Flow Presence ~ High ~ Medium ~ [✓ Low] ~ Depth <6" [✓ inches]/feet

Describe: ______________________________

____

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water ~35-40'
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample ~16'
(Recommended to be less than 25 feet)

Other Site Features of Importance: ______________________________

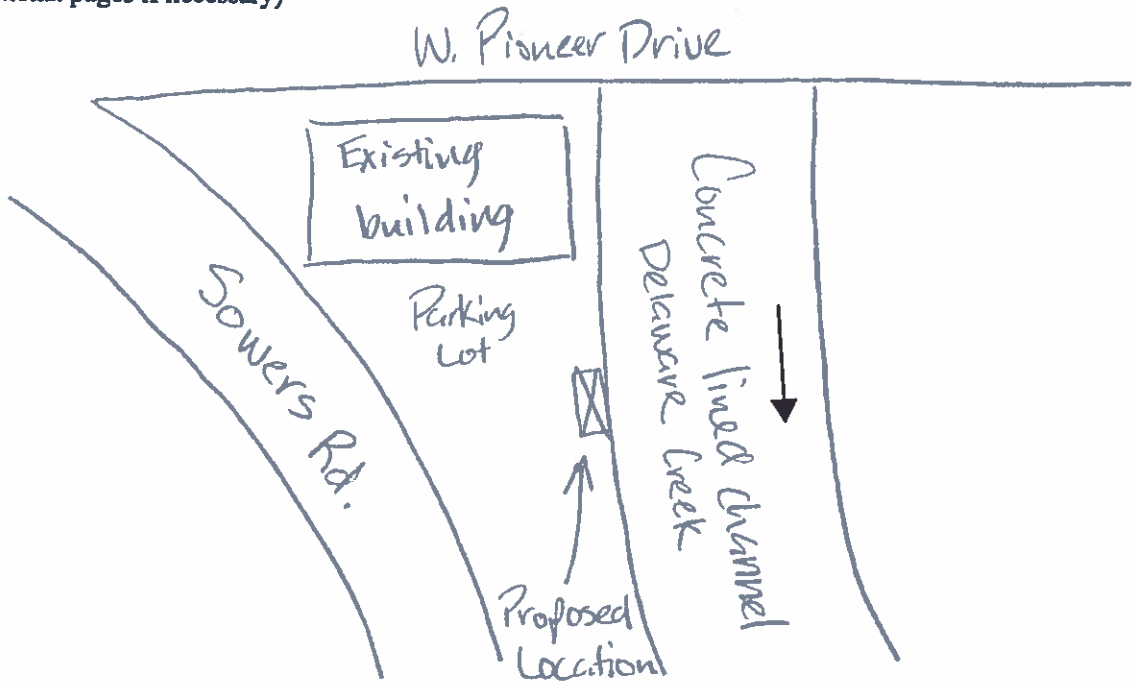
Notes: ______________________________

Provide Site Visit Attendee Name(s) and Company/Entity:

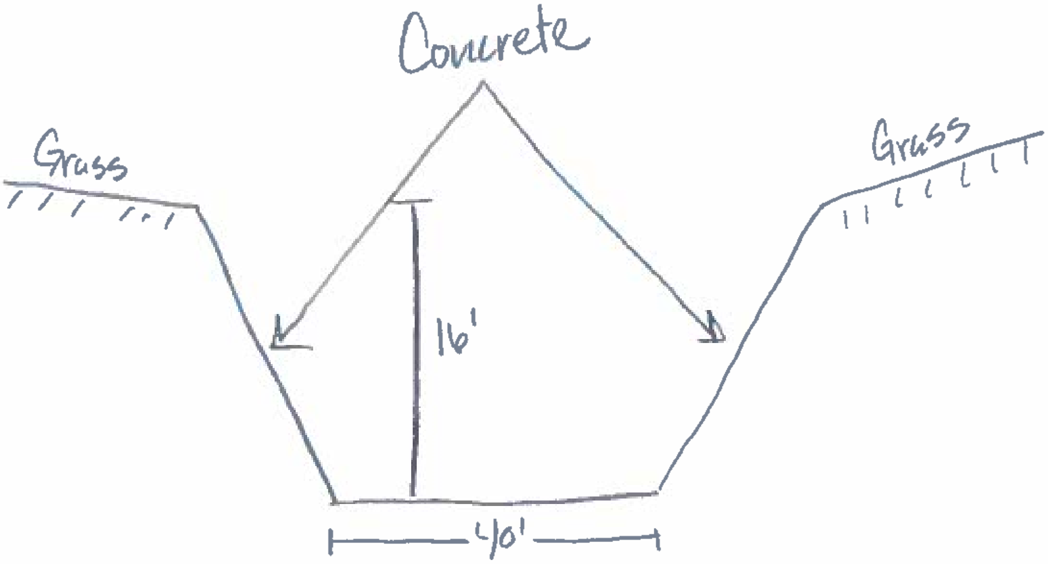
Jeff Shiflet - City of Irving
Ryan Deal - FNI

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: [✓ Upstream] / Downstream (Circle One)

Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/13/17 Time: 10:35

Location Name/Number: IR 004 - East Oakdale Road @ Delaware Creek

Nearest Cross Street/Location Description: South Nursery Road

Entity (Circle One): Arlington Garland [✓ Irving] Mesquite NTTA Plano

GPS Latitude/Longitude: 32.794N , 96.936W

Receiving Water: West Fork Trinity

Data for locating automated samplers:

Ease of Installation ~ [✓ Native or Existing Location / Bench] ~ Need to construct Location / Platform / Base

Describe: Slightly maintained grass area

Ease of channel/sample area access and safety: ~ Describe either [✓ YES] or NO

Describe: Adjacent to E. Oakdale Rd.

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: Concrete lined channel

Vegetative Cover ~ High ~ Medium [✓ ~ Low]

Describe: No veg. in channel

Visibility from the Right-of-Way [✓ ~ High Visibility] ~ Low Visibility ~ None

Describe: Along E. Oakdale Rd.

Public Access ~ [✓ Yes] ~ No

Describe: Sidewalk + Residential access

Evidence of Public Use [✓ Yes] ~ No (Circle all that apply, or describe)

Cans ~ Bottles [✓ Paper] ~ Food Products ~ Rubble ~ Wood ~ Brush ~ Graffiti ~ Transient Community

Describe: Paper debris, small amount

Evidence of Normal Surface Water Elevation ~ Yes ~ No ~ Depth <1 [✓ inches]/feet

Describe:

Perennial Flow Presence ~ High ~ Medium [✓ Low] ~ Depth <1 [✓ inches]/feet

Describe:

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water ~60'
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample ~15-20'
(Recommended to be less than 25 feet)

Other Site Features of Importance: Stormwater outlet @ site

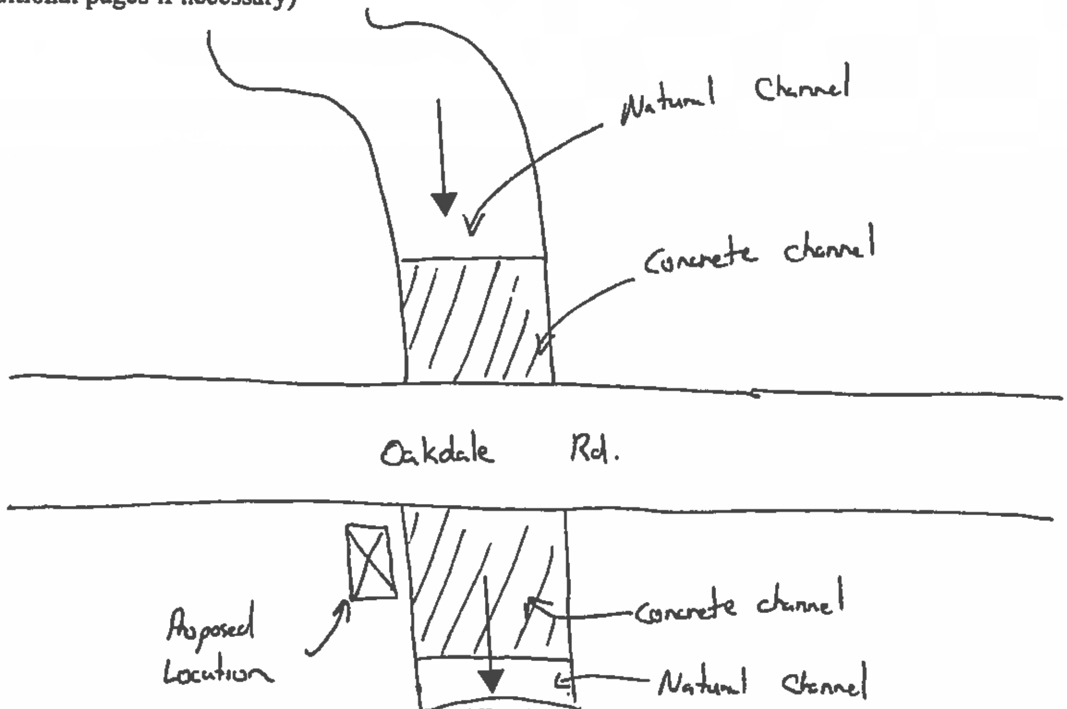
Notes: After speaking with Jeff Shiflet, he mentioned that this location has had theft of solar panels in the past. The city of Irving had to move the sampler off of the main road.

Provide Site Visit Attendee Name(s) and Company/Entity:

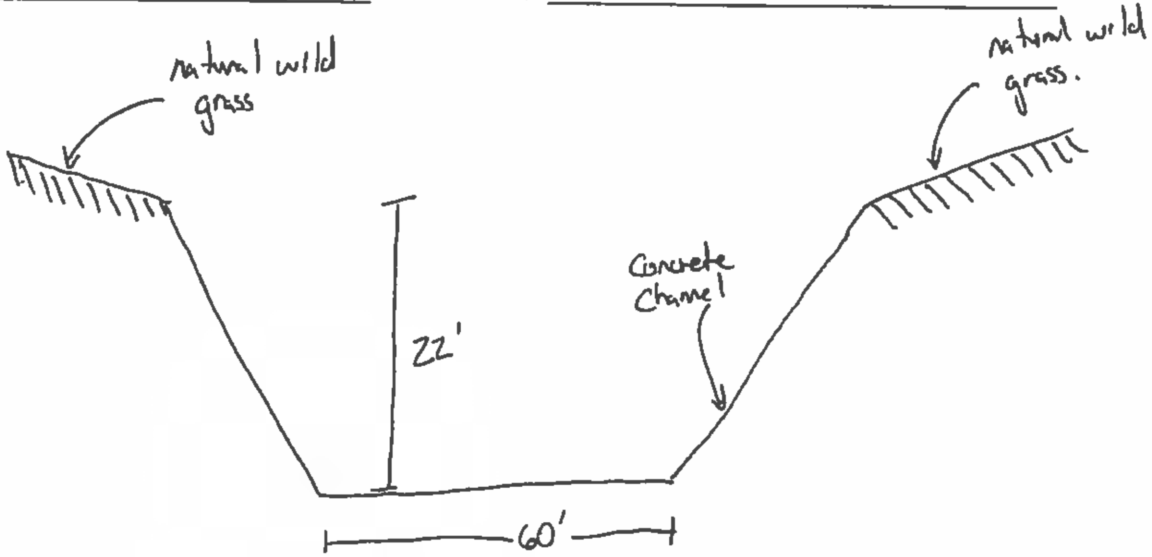
Jeff Shiflet - City of Irving
Ryan Deal - FNI

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: Upstream / Downstream (Circle One)

City of Mesquite

2018 - 2019 Sites

South Mesquite Creek and North Mesquite Creek Watersheds

North of New Market Road

MS1801/1901

North Central Texas
Council of Governments

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North Central Texas
Council of Governments

DFWMaps.com

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North Mesquite Creek at Edward's Church
MS1802/1902

North Central Texas
Council of Governments

DFWMaps.com

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DFWMaps.com

DISCLAIMER
This data has been compiled for NCTCOG.
Various official and unofficial sources were used to gather this information. Every effort was made to ensure the accuracy of this data, however, no guarantee is given or implied as to the accuracy of said data.

N

Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/9/17 Time: 0950 AM

Location Name/Number: MES-001 North of New Market Rd (Paschall Park)

Nearest Cross Street/Location Description: New Market Road

Entity (Circle One): Arlington Garland Irving [✓ Mesquite] NTTA Plano

GPS Latitude/Longitude: 32.75725, -96.6119444

Receiving Water: South Mesquite Creek

Data for locating automated samplers:

Ease of Installation ~ [✓ Native or Existing Location / Bench] ~ Need to construct Location / Platform / Base

Describe: Pre-existing location. Explore platform option due to flooding

Ease of channel/sample area access and safety: ~ Describe either [✓ YES] or NO

Describe: Pre-existing top of bank location. Access via parking lot and trail to the south.

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: Multi-lined; Shelter location side has concrete side slope other bank is natural Bottom is a mix of concrete & rock + sediment Moderately steep slope.

Vegetative Cover ~ High ~ Medium ~ [✓ Low]

Describe: Well maintained grass

Visibility from the Right-of-Way ~ [✓ High Visibility] ~ Low Visibility ~ None

Describe: None from road / High for park / trail patrons

Public Access ~ [✓ Yes] ~ No

Describe: Baseball park; Trail; Park users

Evidence of Public Use ~ Yes ~ [✓ No] (Circle all that apply, or describe)

Cans ~ Bottles ~ Paper ~ Food Products ~ Rubble ~ [✓ Wood] ~ [✓ Brush] ~ Graffiti ~ Transient Community

Describe: ~~[illegible]~~ KS typical instream floatables

Evidence of Normal Surface Water Elevation ~ [✓ Yes] ~ No ~ Depth ~6-15" inches/feet

Describe: Evidence of recent rain

Perennial Flow Presence ~ High ~ Medium ~ [✓ Low] ~ Depth ~6-15" inches/feet

Describe: See above

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water ~20-25 ft
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample ~10-11 ft
(Recommended to be less than 25 feet)

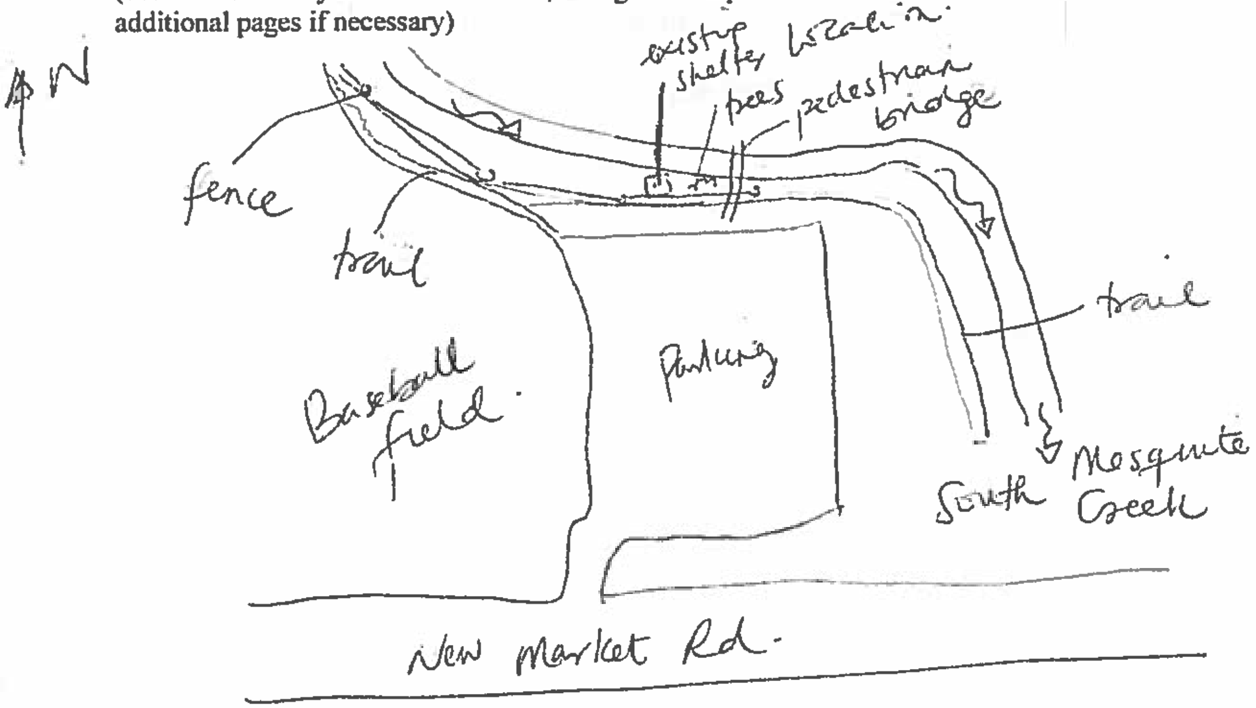
Other Site Features of Importance: Existing site with Shelters already in place.

Notes:

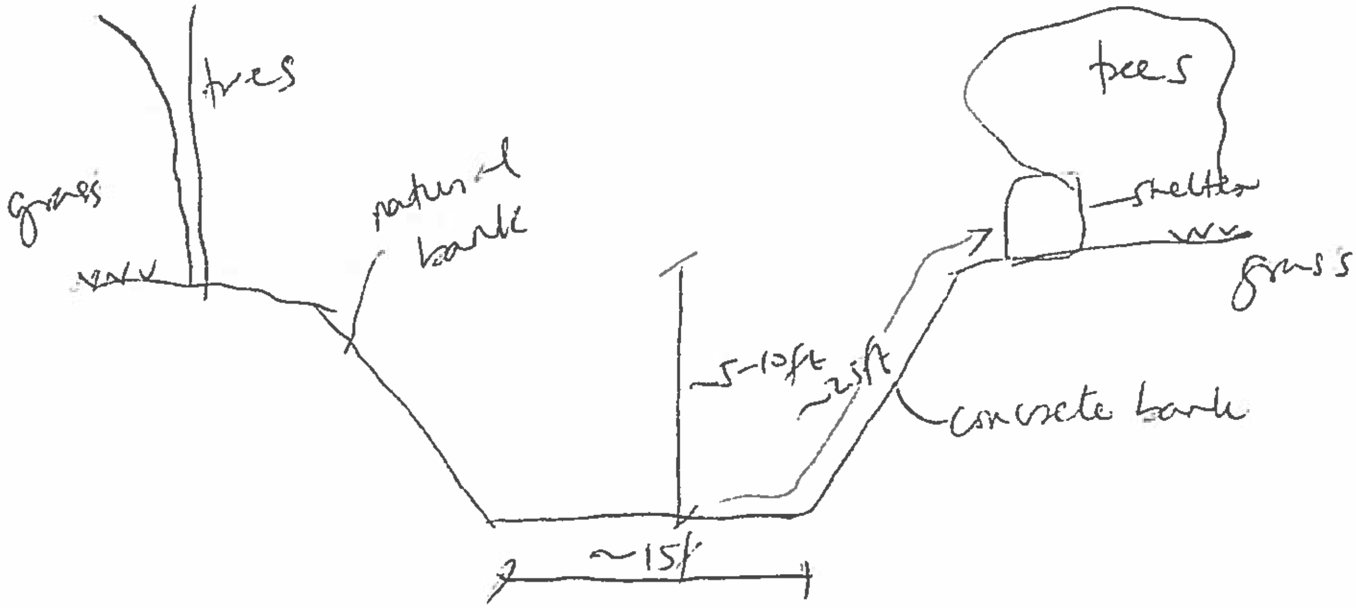
Provide Site Visit Attendee Name(s) and Company/Entity:
Robert Byrom (City of Mesquite)
Kofi Sam (Atkins)

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: Upstream / [✓ Downstream] (Circle One)

Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/9/17 Time: 1011 AM

Location Name/Number: MES-002 N Mesquite Creek @ Edwards Church

Nearest Cross Street/Location Description: Edwards Church Road

Entity (Circle One): Arlington Garland Irving [✓ Mesquite] NTTA Plano

GPS Latitude/Longitude: 32.732111°, -96.5505

Receiving Water: N Mesquite Creek

Data for locating automated samplers:

Ease of Installation ~ [✓ Native or Existing Location / Bench] ~ Need to construct Location / Platform / Base

Describe: Pre-existing location. Explore potential platform option due to flooding

Ease of channel/sample area access and safety: ~ Describe either [✓ YES] or NO

Describe: Pre-existing top of bank location. north of first bridge.
Access via north side pavilion/mini driveway east of creek.

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: Natural channel; natural/earthen bank with
rock/mesh lined lower bank bottom.

Vegetative Cover ~ High ~ Medium ~ [✓ Low]

Describe: Low grass/brush

Visibility from the Right-of-Way ~ High Visibility ~ [✓ Low Visibility] ~ None

Describe: Visible from side walk

Public Access ~ [✓ Yes] ~ No

Describe: Side walk south of shelter location.

Evidence of Public Use ~ Yes [✓ No] (Circle all that apply, or describe)

Cans ~ Bottles ~ Paper ~ Food Products ~ Rubble ~ Wood ~ Brush ~ Graffiti ~ Transient Community

Describe: Instream wood/timber / logs and sediment

Evidence of Normal Surface Water Elevation [✓ Yes] ~ No ~ Depth ~8"-12" inches/~~feet~~

Describe: moderate flow; recent rain

Perennial Flow Presence ~ High ~ Medium [✓ Low] ~ Depth ________ inches/feet

Describe: See above

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water ~54ft
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample ~5-7ft
(Recommended to be less than 25 feet)

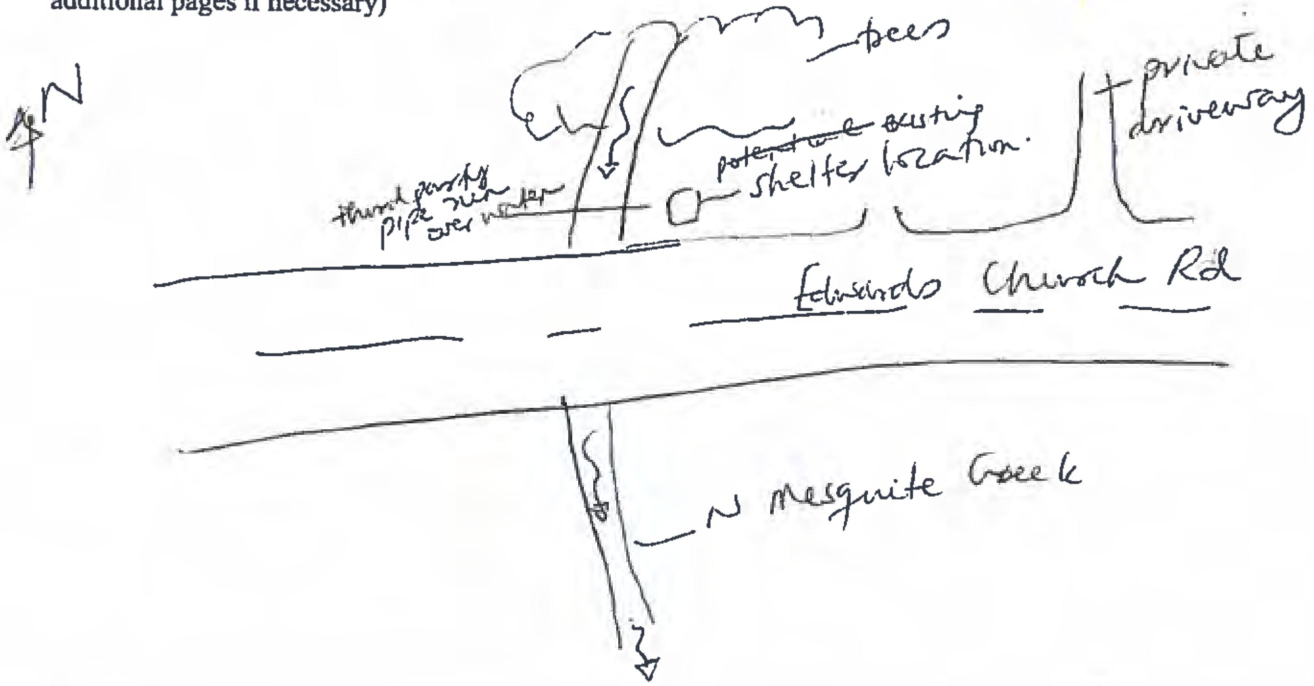
Other Site Features of Importance: Existing site with shelters already in place.

Notes:

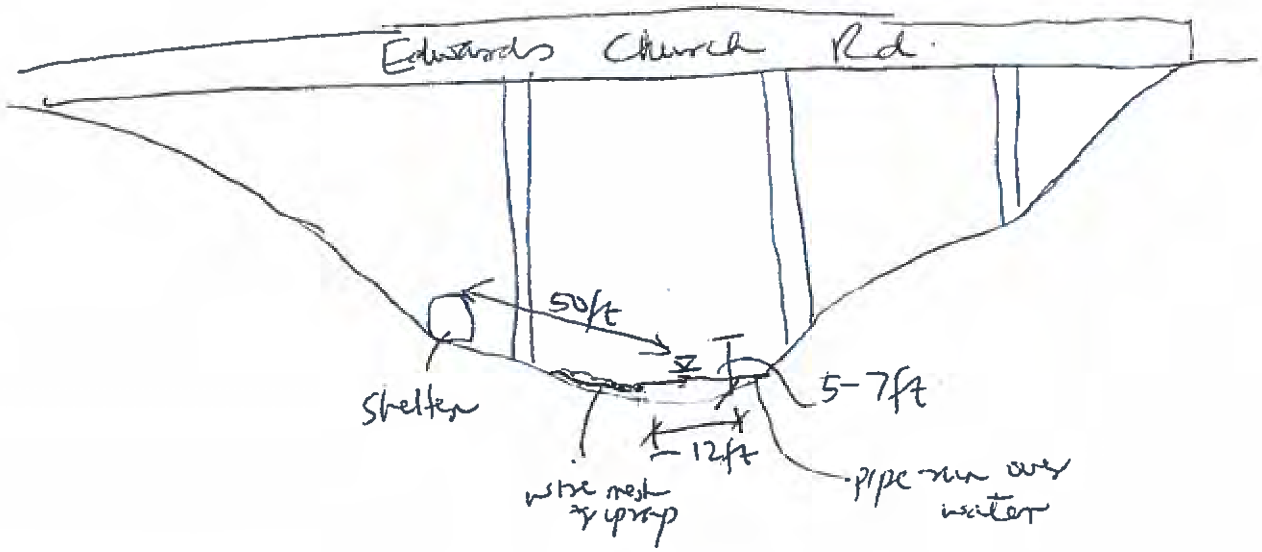
Provide Site Visit Attendee Name(s) and Company/Entity:
Robert Brown (City of Mesquite)
Kofi Sam (ATKINS)

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: Upstream [✓ Downstream] (Circle One)

City of Plano

2018 - 2019 Sites

Spring Creek Watershed

Spring Creek at 16th Street

PL1801/1901

North Central Texas
Council of Governments

DFWMaps.com

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North Central Texas
Council of Governments

DFWMaps.com

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Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/16/17 Time: 10:15 AM

Location Name/Number: Spring Creek @ 16th Street PL01B

Nearest Cross Street/Location Description: 16th Street

Entity (Circle One): Arlington Garland Irving Mesquite NTTA [✓ Plano]

GPS Latitude/Longitude: 33.021317° / -96.712406°

Receiving Water: Spring Creek

Data for locating automated samplers:

Ease of Installation [✓ Native or Existing Location / Bench] Need to construct Location / Platform / Base

Describe: Concrete base/platform on sanitary line (existing)

Ease of channel/sample area access and safety: Describe either [✓ YES] or NO

Describe: Harrington Park; parking lot access to site

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: Natural, unlined, open channel with rock bottom

Vegetative Cover High Medium [✓ Low]

Describe: Some brush, manicured grass at top of bank, trees near stream

Visibility from the Right-of-Way [✓ High Visibility] ~~Low Visibility~~ CR None

Describe: Visible from roadway

Public Access [✓ Yes] No

Describe: ~~From trail~~ Adjacent to walk/bike trail

16th Street

Evidence of Public Use [✓ Yes] No (Circle all that apply, or describe)

[✓ Cans] Bottles [✓ Paper] Food Products [✓ Rubble] Wood [✓ Brush] [✓ Graffiti] Transient Community

Describe: Trash present under bridge and in adjacent areas

Evidence of Normal Surface Water Elevation [✓ Yes] No Depth ~1 inches/[✓ feet]

Describe: Uniform depth under bridge crossing

Perennial Flow Presence High [✓ Medium] Low Depth ~1 inches/[✓ feet]

Describe: Uniform flow near proposed location

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water 30 ft
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample 20 ft
(Recommended to be less than 25 feet)

Other Site Features of Importance:

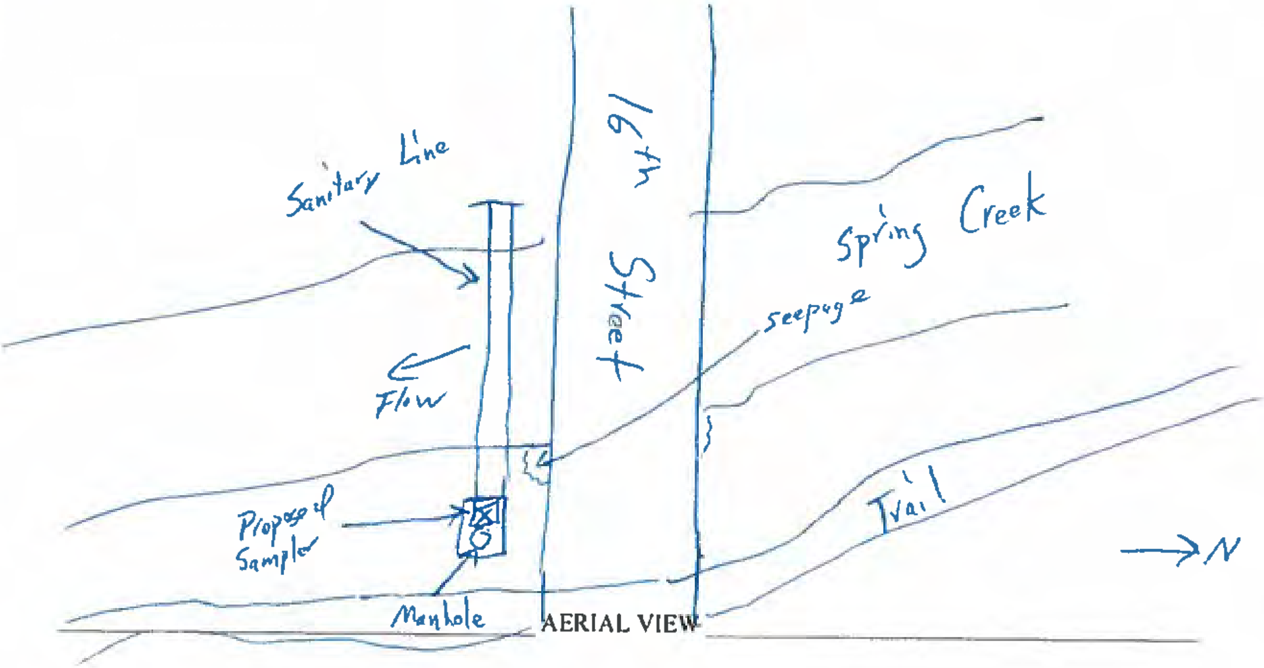
Notes: Evidence of overflow event from sanitary manhole (stains on manhole); seepage occurring under bridge

Provide Site Visit Attendee Name(s) and Company/Entity:

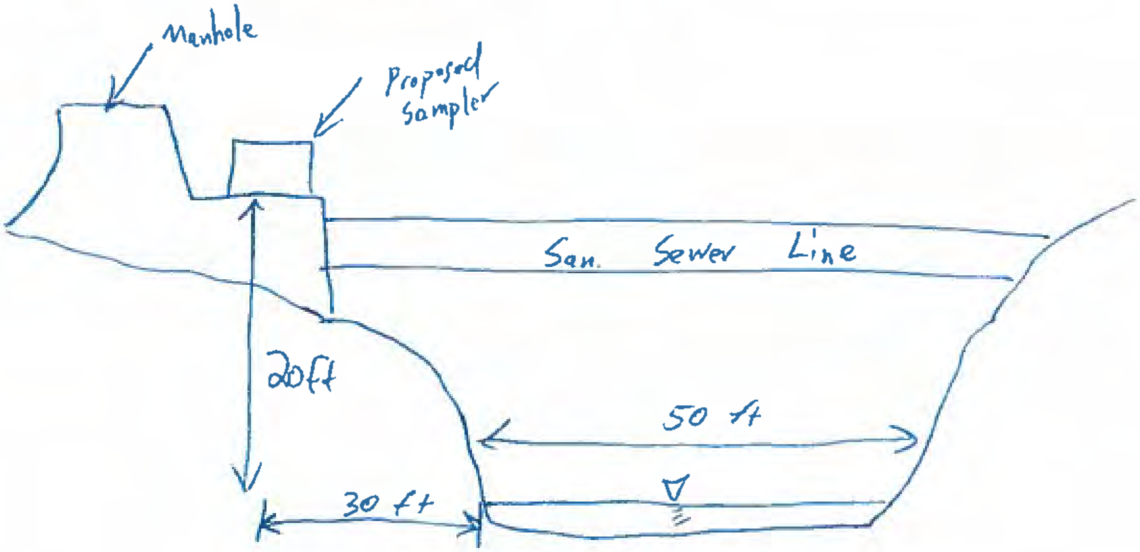
Chad Richards - Atkins
Mayra Lopez - NCTCOG
Heather Firn - City of Plano

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: Upstream / [✓ Downstream] (Circle One)

NTTA

2018 - 2019 Sites

Cottonwood Branch – Hackberry Creek and Cottonwood Creek – Mountain Creek Lake Watersheds

Unnamed Tributary at SH161 N of Gateway Drive

NT1801/1901

North Central Texas
Council of Governments

DFWMaps.com

N

North Central Texas Council of Governments

DFWMaps.com

Cottonwood Creek at SH161 S of Dickey Road

NT1802/1902

North Central Texas
Council of Governments

DFWMaps.com

N

North Central Texas
Council of Governments

DFWMaps.com

N

Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/3/17 Time: 1258 PM

Location Name/Number: NTTA - 001B

Nearest Cross Street/Location Description: PGBT @ North of Gateway Dr

Entity (Circle One): Arlington Garland Irving Mesquite [✓ NTTA] Plano

GPS Latitude/Longitude: 32.889808, -96.980065

Receiving Water: Unnamed Tributary to Hackberry Creek

Data for locating automated samplers:

Ease of Installation ~ [✓ Native or Existing Location / Bench] ~ Need to construct Location / Platform / Base

Describe: level ground on top of bank

Ease of channel/sample area access and safety: ~ Describe either [✓ YES] or NO

Describe: Park on grass adjacent to culvert or in parking lot south of location and walk to site.

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: 4-~~box~~ pipe culvert apron with concrete bottom & sides serves as forebay into concrete lined trib to Hackberry Creek

Vegetative Cover ~ High ~ Medium ~ [✓ Low]

Describe: Well maintained grass cover

Visibility from the Right-of-Way ~ [✓ High Visibility] ~ Low Visibility ~ None

Describe: Vehicular traffic visibility

Public Access ~ [✓ Yes] ~ No

Describe: Vehicular traffic visibility

Evidence of Public Use – Yes – [✓ No] (Circle all that apply, or describe)

Cans – Bottles – Paper – Food Products – Rubble – Wood – Brush – Graffiti – Transient Community

Describe: No sign of public use

Evidence of Normal Surface Water Elevation [✓ Yes] – No – Depth 1'' inches/feet

Describe: 1'' depth on concrete apron drops to about 2' forebay

Perennial Flow Presence – High – Medium – [✓ Low] – Depth 1'–2' inches/feet

Describe: See above

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water ~15ft
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample ~5ft
(Recommended to be less than 25 feet)

Other Site Features of Importance:

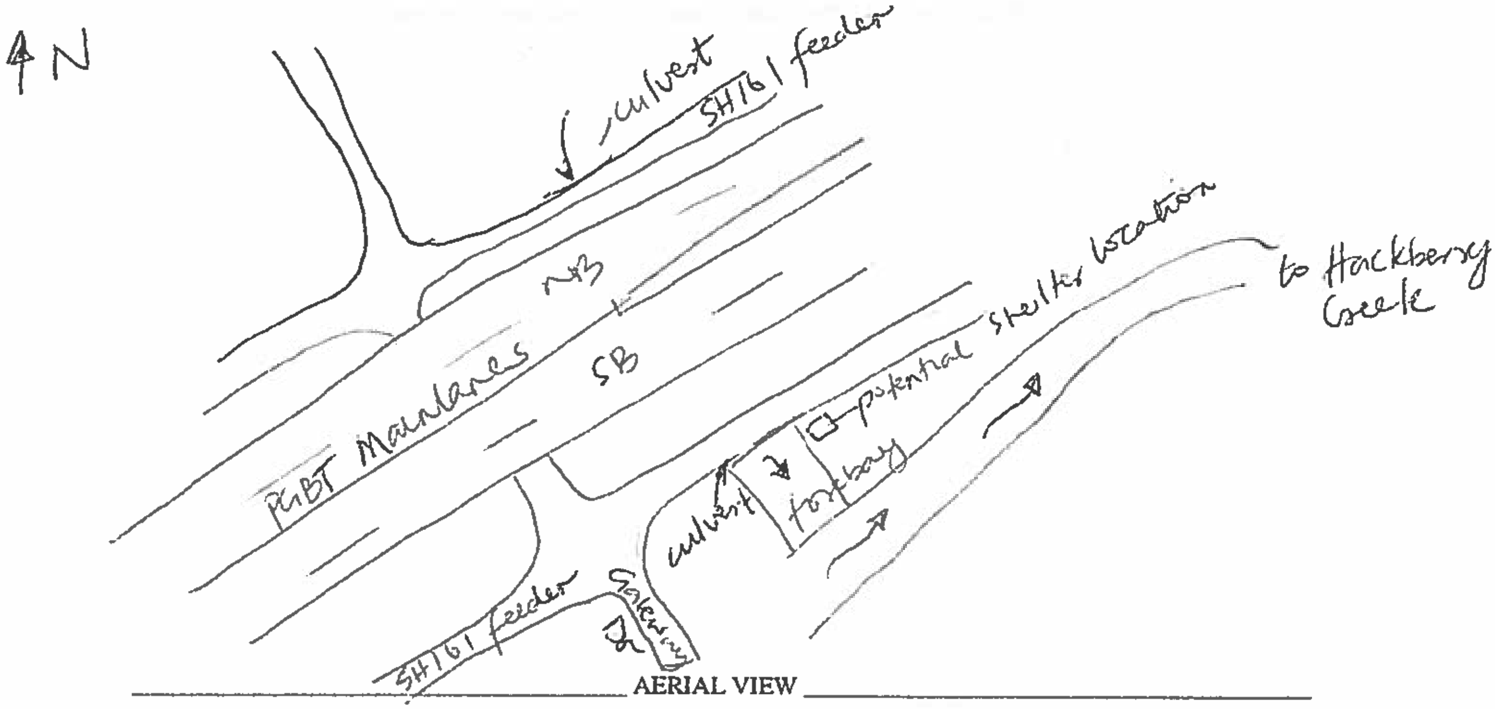
Notes:

Provide Site Visit Attendee Name(s) and Company/Entity:

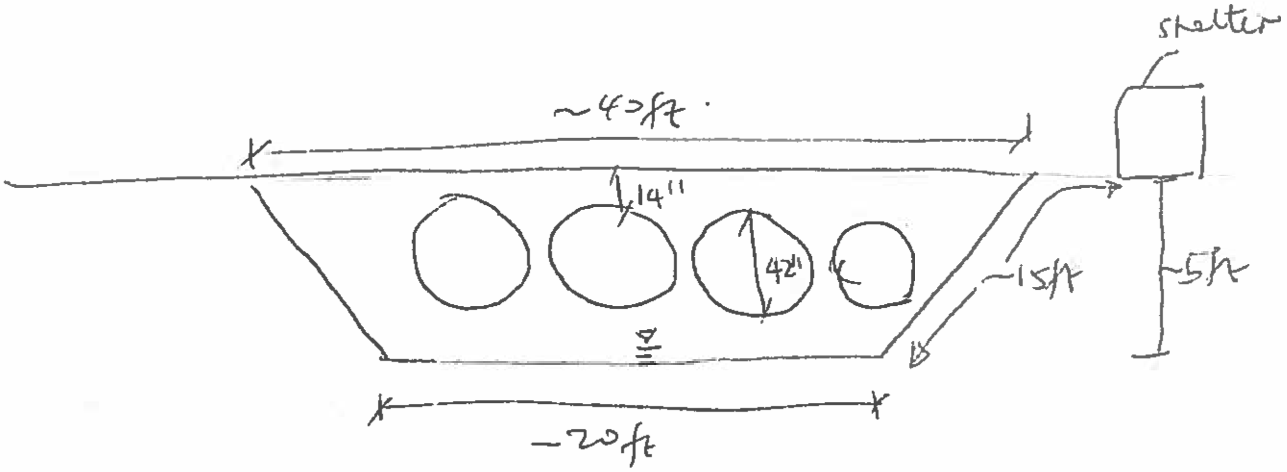
Moss Ferrell (VRX) On behalf of NTTA
Kofi Fam (ATKINS)

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: [✓ Upstream] / Downstream (Circle One)

Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date: 11/3/17 Time: 1124 AM

Location Name/Number: NTTA – 002

Nearest Cross Street/Location Description: PGBT @ South of Dickey Rd

Entity (Circle One): Arlington Garland Irving Mesquite [✓ NTTA] Plano

GPS Latitude/Longitude: 32.728181, -97.01946

Receiving Water: Cottonwood Creek

Data for locating automated samplers:

Ease of Installation ~ [✓ Native or Existing Location / Bench] ~ Need to construct Location / Platform / Base

Describe: level ground; south of Creek; east of gravel swale Explore bench

Ease of channel/sample area access and safety: ~ Describe either [✓ YES] or NO

Describe: Park in paved area south of proposed location next to gravel swale

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: Natural grass lined channel with rocks in bottom

Vegetative Cover ~ High ~ Medium ~ [✓ Low]

Describe: Low at top of bank; Some medium brush in channel; poison ivy dotted on bank

Visibility from the Right-of-Way – High Visibility ~ [✓ Low Visibility] ~ [✓ None]

Describe: Not visible to vehicular traffic but to transient community

Public Access ~ [✓ Yes] ~ No

Describe: See public use

Evidence of Public Use ~ [✓ Yes] ~ No (Circle all that apply, or describe)

[✓ Cans] ~ Bottles ~ [✓ Paper] ~ Food Products ~ Rubble ~ [✓ Wood] ~ [✓ Brush] ~ Graffiti ~ [✓ Transient Community]

Describe: typical instream floatables plus a transient person sleeping under bridge

Evidence of Normal Surface Water Elevation ~ [✓ Yes] ~ No ~ Depth ~4" inches/feet

Describe: Rapid low flow within multiple forks that converge under feeder bridge. Dam structure/ reservoir upstream

Perennial Flow Presence ~ High ~ Medium ~ [✓ Low] ~ Depth ~4" inches/feet

Describe: See above.

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water 40-50ft
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample ~10-15ft
(Recommended to be less than 25 feet)

Other Site Features of Importance:

Notes:

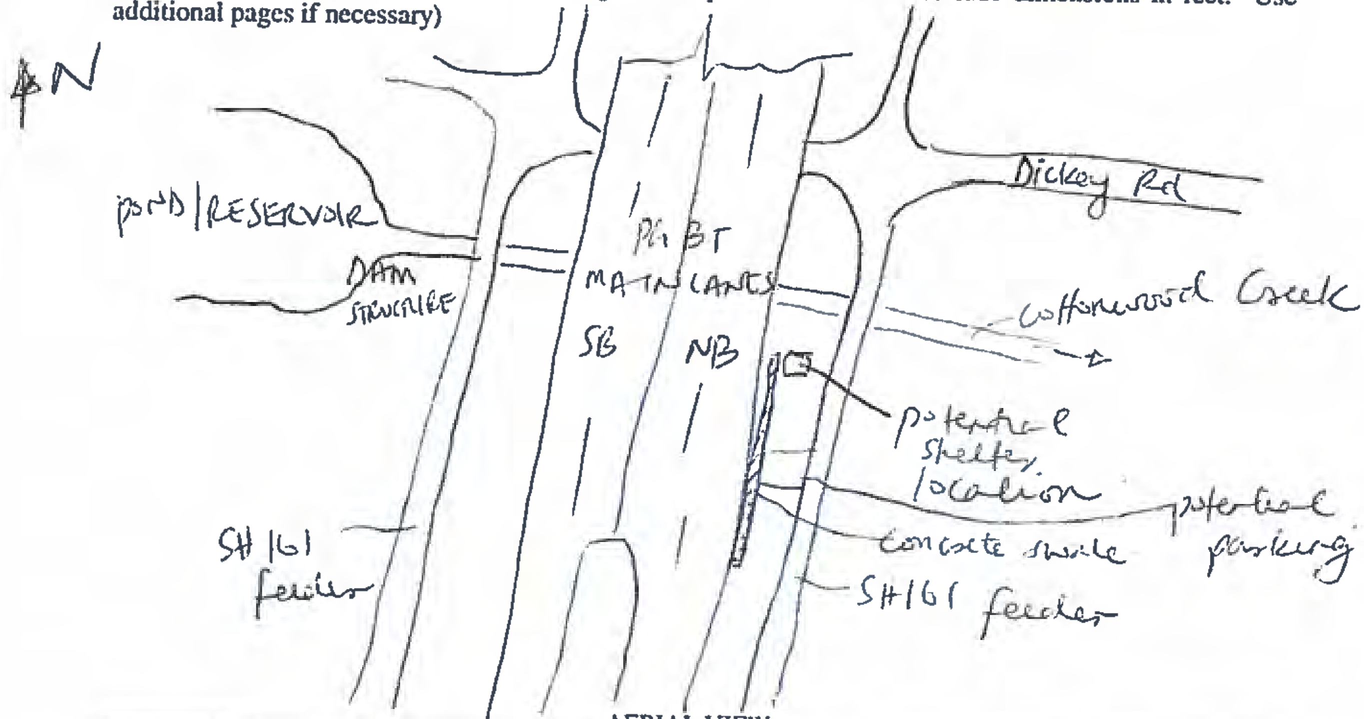
Provide Site Visit Attendee Name(s) and Company/Entity:

Moss Ferrell (VRX) On behalf of NTTA

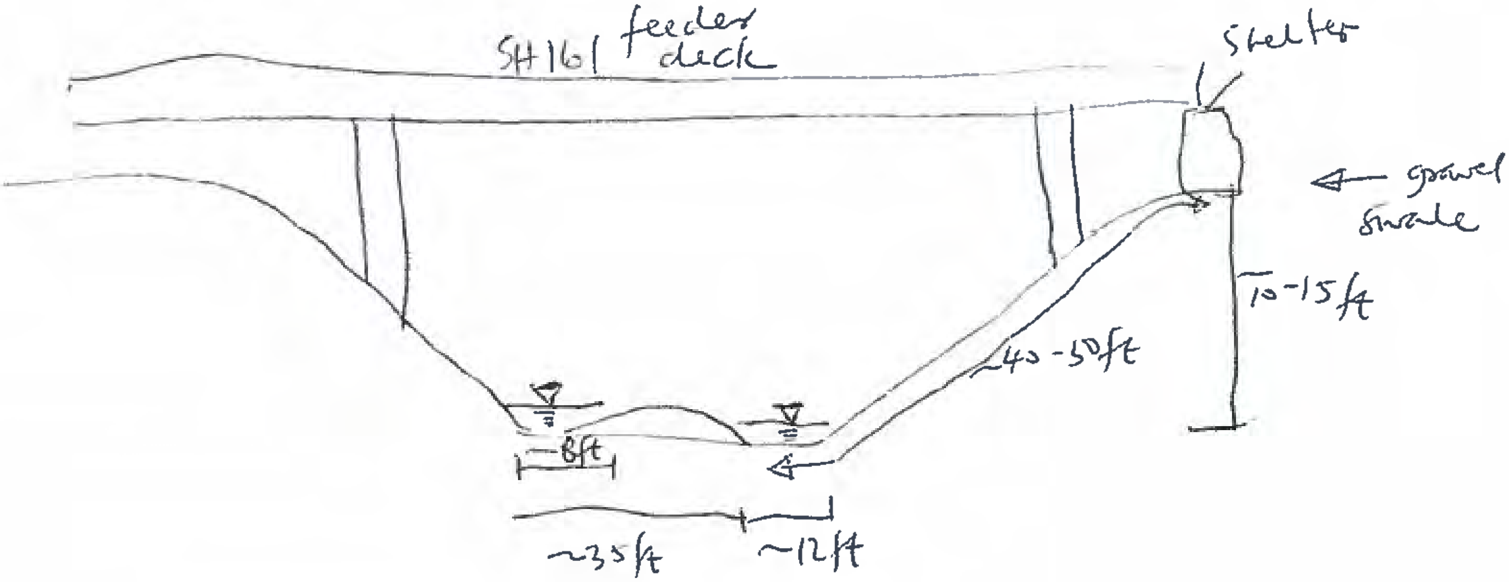
Kofi Sam (ATKINS)

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)



AERIAL VIEW



CROSS SECTION

Facing: Upstream / [✓ Downstream] (Circle One)

Appendix B

Vendor Literature

Isco 6712C Compact Portable Sampler

Isco's 6712C Compact Portable Sampler delivers the advanced capabilities of our industry standard 6712 Sampler in a smaller package, allowing use where full-size samplers won't fit. Like the full-size 6712, the compact version uses Isco's advanced 6700 Series Controller, a device that allows you to select from a variety of programming modes, assuring the most suitable routine for your application. Programming is fast and simple, with on-line help just a key stroke away.

The environmentally-sealed 6712 controller delivers maximum accuracy and easily handles all of your sampling applications, including:

- wastewater effluent
- stormwater monitoring
- CSO monitoring
- permit compliance
- pretreatment compliance

In the Standard Programming Mode, the controller walks you through the sampling sequence step-by-step, allowing you to choose all parameters specific to your application. Selecting the Extended Programming Mode lets you enter more complex programs.

This comparison photo, showing the 6712C with mini base (left) and Isco's full-sized Portable Sampler (right), illustrate the broad scope of sampler configurations Isco offers to suit your particular sampling needs.

An optional telephone modem allows programming changes and data collection to be performed remotely, from a touch-tone phone. It also has dial-out alarm features.

Versatile, Tough, and Reliable

A tapered design and narrow 18-inch (45.7 cm) diameter allows use in small or offset manholes. Choose from five bottle configurations to suit a variety of sampling routines.

Isco's 6712C Compact Portable Sampler carries a NEMA 4X, 6 (IP67)corrosion-proof rating for submersible, watertight, dust-tight,and corrosion-resistant service.

Superior capability, rugged construction, and compact size, make this sampler ideal for size-restricted applications.

All 6712 Samplers share the following features:

Advanced Delivery System

The 6712's peristaltic pump delivers samples at the EPA-recommended velocity of 2 ft/sec., even at head heights of 26 feet. At a head height of 3 feet, line velocity is 3 ft/sec. No other automatic sampler achieves this level of performance!

Our patented* pump revolution counter tells you when tubing should be replaced. Changing tubing is a snap; there are no pump covers, collars or tools to slow you down. An exclusive safety interlock removes power from the pump when it's opened.

Step-by-Step Programming

This feature walks you through the sampling sequence and allows you to choose all parameters specific to your application:

- When to start
- What volume to collect
- How to distribute samples
- If samples are to be time- or flow-paced.

You can easily enter complex programs to suit your unique needs. Available routines include:

- Pause and resume for intermittent discharge flow monitoring
- Sampler pacing by time, non-uniform time, flow or external event
- Random interval sample collection

Convenient Data Retrieval

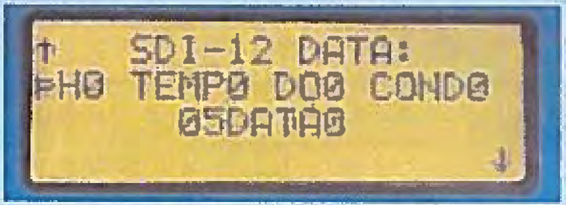
Every 6712 Sampler is also a powerful data logger. Sampling, flow, rainfall, and other water quality data can be stored in its 512 KB memory.

Data may be retrieved directly into a Flowlink® 4 equipped PC in three ways:

- Via cable connection
- Remotely, via Isco's 2102 Wireless Communication System
- By phone, using our optional built-in modem

SDI-12 Interfacing

The 6712 functions as a SDI-12 logger and connects to any sensor that fully implements the protocol standard.



Display window showing SDI-12 connection status.

In addition, Isco has defined extended commands to enable "plug and play" communications and ease of programming. These commands are implemented by the sensor manufacturer. Data are identified and logged by their specific type.

Expand your monitoring capabilities with these products and accessories.

Contact Isco or your Isco Representative to receive specific literature and prices on the following items.

Telephone Modem

A factory-installed option that lets you set up and make programming changes, or collect data from your 6712 sampler from the comfort of your office.

581 RTD (Rapid Transfer Device)

Slim enough to fit in your shirt pocket, yet rugged enough to withstand submersion, the 581 RTD lets you quickly retrieve and transfer data without taking your laptop computer into the field.

ProPak™ Disposable Sample Bags

Isco's patented ProPak bags eliminate the expense of washing and storing bottles, while taking away worries about contamination from previous samples. The bags are available with a 1000 ml capacity, or in a 2-gallon version for composite sampling.

Flowlink Software

Isco's advanced Flowlink® 4 for Windows Data Management Software harnesses the power of Microsoft Windows® to retrieve, import, compare, and analyze data, generate advanced charts and graphs, create comprehensive reports, and more.

700 Series Modules

Our 700 Series Modules let you adapt your 6712 sampler for a variety of jobs. These compact modules are environmentally sealed and may be added to your 6712 system at any time.

701 – pH and Temperature Module

Combines accurate pH and temperature monitoring in one module. It will also activate your 6712 Sampler at a user-elected pH or temperature range.

710 – Ultrasonic Flow Module

Uses our field-proven ultrasonic level sensor that doesn't require submersion in the flow stream.

720 – Submerged Probe Flow Module

Provides accurate measurement at sites where wind, steam, foam, turbulence, or air temperature fluctuations exist. Suitable for small channels, it accurately senses pressure even when covered with silt and sand.

730 – Bubbler Flow Module

Get the dependability and accuracy of Isco bubbler flow meters in a miniaturized package. The 730 is unaffected by changing stream conditions, and level measurement remains accurate despite temperature fluctuations or exposure to harsh chemicals.

750 – Area Velocity Flow Module

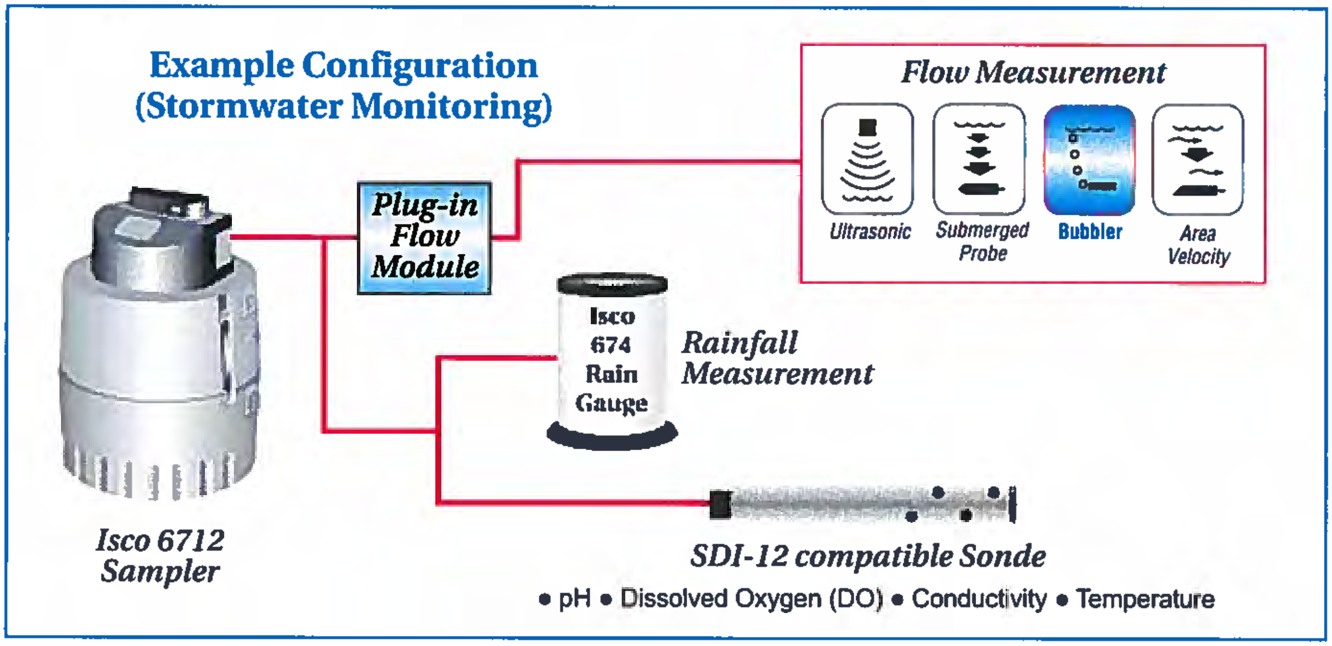
Gives greater accuracy where weirs and flumes are not practical, and where submerged, full pipe, surcharged, and reverse flow conditions may occur. And, you don't have to estimate the slope and roughness of the channel.

780 – Smart 4-20 Module

Add intelligence to a simple analog signal. Flow rates are displayed in actual volume units, not merely a percent of full scale. Any linear 4-20 mA input can be characterized by using the 780. The information can be stored and retrieved for later analysis.

Integrated Water Monitoring

Isco 6712 Samplers feature "plug and play" connection with SDI-12 compatible measuring devices - including multi-parameter sondes from leading manufacturers. Combined with the 6712's standard 512 KB of memory, enough for more than 200,000 stored readings. SDI-12 networking gives you great flexibility for logging environmental data, and for "smart sampling" event notification, triggered on any combination of up to 16 inputs.



Isco 6712C Compact Portable Sampler Specifications

Sampler

Height	27.6 in.	70.1 cm
Diameter	17.7 in.	45.1 cm
Weight (Dry/Less Battery)	31 lbs.	14 kg
Material	High-strength ABS plastic outer shell Stainless steel hardware	
Power Requirements	12 VDC	

Pump

Intake Purge	Adjustable air purge before and after each sample.	
Tubing Life Indicator	Provides a warning to change pump tubing.	
Intake Suction Tubing		
Length	3 to 99 ft.	1 to 30 m
Material	Vinyl or Teflon® lined	
Inside Dimension	⅜ in.	1 cm
Pump Tubing Life	Typically 1,000,000 pump counts	
Maximum Suction Lift	28 ft.	8.5 m
Typical Repeatability	±5 ml or ±5% of the average volume in a set	
Typical Line Transport Velocity at head heights of:		
3 ft. (0.9 m)	3.0 ft./s	0.91 m/s
10 ft. (3.1 m)	2.9 ft./s	0.87 m/s
15 ft. (4.6 m)	2.7 ft./s	0.83 m/s
Liquid Presence Detector	Non-wetted, non-conductive sensor detects when liquid sample reaches the pump to automatically compensate for changes in head heights.	

Controller

Weight	13 lbs.	5.9 kg
Dimensions	10.3 x 12.5 x 10 in.	26 x 31.7 x 25.4 cm
Operational Temperature	32° to 120°F	0° to 49°C
Enclosure Rating	NEMA 4X, 6	IP67
Program Memory	Non-volatile ROM	
Flow Meter Signal Requirements	5 to 15 volt DC pulse or 25 millisecond isolated contact closure.	
Number of Programmable Composite Samples	1 to 999 samples.	
Real Time Clock Accuracy	1 minute per month, typical	

Software

Sample Frequency Selection	1 minute to 99 hours 59 minutes, in 1 minute increments. Non-uniform times in minutes or clock times 1 to 9,999 flow pulses
Sampling Modes	Uniform time, non-uniform time, flow. *(Flow mode is controlled by external flow meter pulses.)*
Programmable Sample Volumes	10 to 9,990 ml in 1 ml increments
Sample Retries	If no sample is detected, up to 3 attempts, user selectable
Rinse Cycles	Automatic rinsing of suction line up to 3 rinses for each sample collection
Program Storage	5 sampling programs
Sampling Stop/Resume	Up to 24 real time/date sample stop/resume commands
Controller Diagnostics	Tests for RAM, ROM, pump display, and distributor

Ordering Information

Description	Part Number
6712C Compact Portable Sampler Includes controller with 512 KB RAM, top cover, center section, base, distributor arm, instruction manual, pocket guide.	**68-6710-071**
6712C Compact Portable Sampler with Mini Base (Includes items described above)	**68-6710-141**

Note: *Power source, bottle configuration, suction line, and strainer must be ordered separately. Other options and accessories are also available. Contact Isco or your Isco Representative for complete information.*

The 6712 Controller is an SDI-12 logger. Manual pump operations are now located on the front panel keys.

The 6712C Compact Portable Sampler features Isco's exclusive bottle carrier to make bottle changing and transportation a snap.

ISCO®
www.isco.com

Isco, Inc.
4700 Superior St.
Lincoln, NE 68504 USA
Phone: (402) 464-0231
USA & Canada: (800) 228-4373
Fax: (402) 465-3022
E-Mail: info@isco.com

Isco Flowlink® 5 Software

Isco's Flowlink is the premier flow data management software. Flowlink 5's advanced analysis, editing, and reporting, assure continued industry leadership.

Easy instrument configuration

Set up the following Isco instruments — on-site or remotely:

- 2100 Series Flow Modules
- 4100 Series Flow Loggers
- 4200 Series Flow Meters
- 676 Logging Rain Gauge systems

Enhance battery life by scheduling specific "run times" for communication modules.

Save configuration time by cloning when a flowmeter is replaced, or conditions are similar at another site.

Data handling options

Download data on site to your laptop PC, Isco 581 Rapid Transfer Device (RTD), or Isco 2101 Field Wizard.

Collect data from 2100 Series modules remotely via an Isco 2102 Wireless Module, 2103 Telephone or 2103c Cell Phone Modem.

Collect data from Isco 4200 Series Flow Meters and 6700 Series Samplers with voice modems.

Automate data collection.

Display default graphs immediately after data retrieval to quickly assess site conditions.

Import CSV-formatted data from non-Isco instruments.

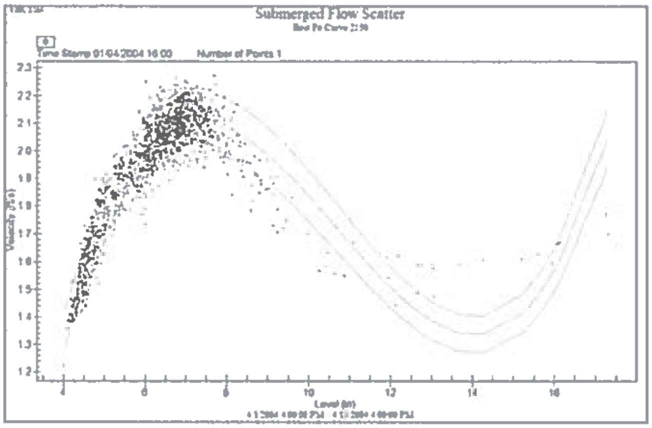
Convert Flowlink 4 files to Flowlink 5.

Archive data to a zipped file on a network drive and back up your database to insure against loss.

Data Presentation

- Drag and drop data onto graphs and tables.
- Generate graphs with up to four panes, with multiple data types in each pane.
- Display rainfall.
- Display sample events.
- Display scatter plots. Generate a best-fit curve with limits for analysis.
- Add text boxes to label events.
- Generate vertical lines that span all panes for accurate values of different parameters at specific times.
- Generate horizontal lines to distinguish points outside limits.

Scatter Plot

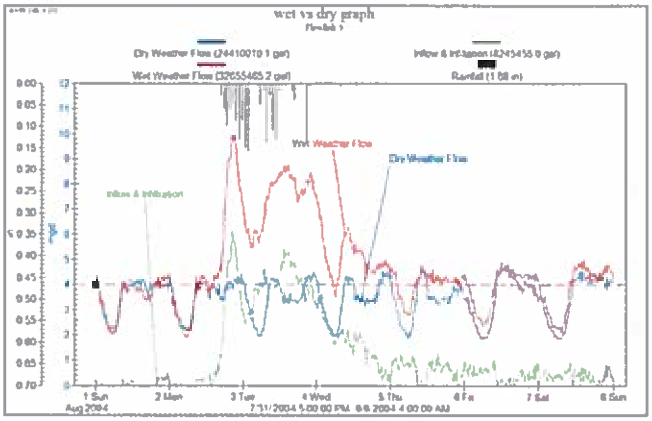


Generate flow channel performance pictures. Add upper and lower limits to indicate fitness of data by a percentage of offset, or test fitness of data using Manning Formula coefficients.

Advanced Data Analysis

- Calculate average, minimum, maximum, and total accumulated values.
- Compare data from multiple sites.
- Use series formulas to know the relation between sites or parameters.
- Zoom vertically and horizontally.
- Generate reference curves for wet weather analysis or problem identification.
- Compare flows using the continuity equation and Manning formula.

Wet vs. Dry Comparison



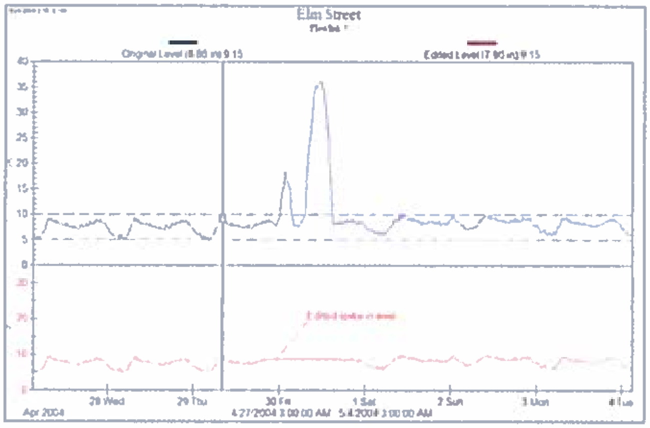
Create reference curves (blue line) for comparisons. Import rain data (inverted from top of graph) to help see the relationship between rainfall and I&I.

Editing Capability

External noise, site conditions, etc. can adversely affect data quality. Also, data from flow meters lacking Isco's exceptional stability can be corrected for calibration or temperature drift.

- Edit data with constant offset, fixed offset, proportional, time, or auto-correct functions.
- Edit data values by dragging them to correct values or by selecting multiple data values in a block, then applying corrections.
- Adjust scatter plot data within limits, or to the centerline of the best fit curve.
- View changes in a graph or table after editing.
- Copy, paste, cut, and insert.
- Show modified data in a different color.

Edited Graph

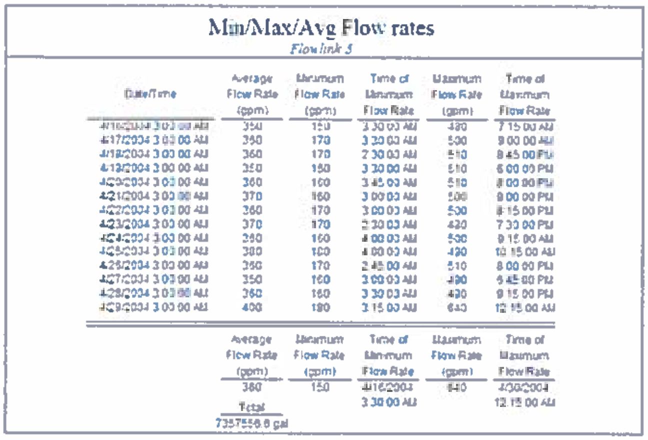


The erroneous spikes shown above would skew calculations. Simply highlight them and click "auto-correct".

Reporting

- Include Flowlink graphs and tables in Microsoft Word®, Excel®, and PowerPoint® with object linking and embedding (OLE).
- Exported into CSV format for analysis in spreadsheet programs. Export graphs and tables in HTML or PDF format.
- Automatically retrieve data, print graphs and tables, import/export data, and run command-line driven programs.

Printable Table



Min/Max/Avg Flow rates

Flowlink 5

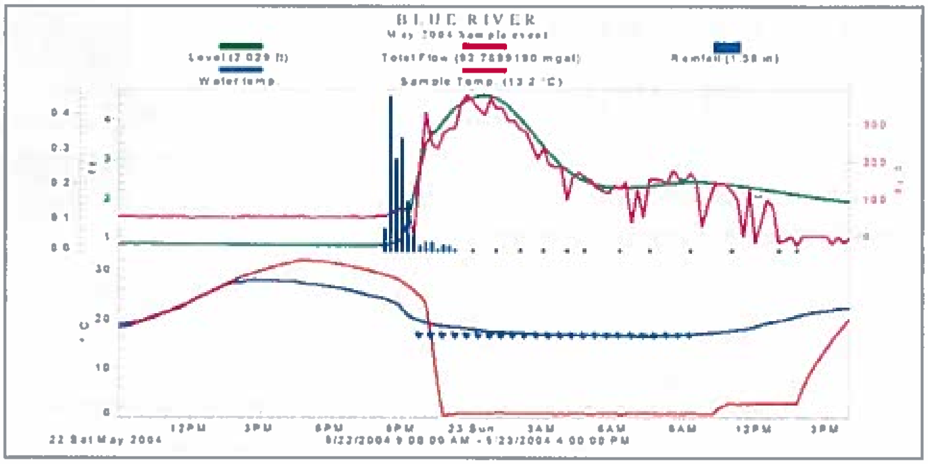
Date/Time	Average Flow Rate (gpm)	Minimum Flow Rate (gpm)	Time of Minimum Flow Rate	Maximum Flow Rate (gpm)	Time of Maximum Flow Rate
4/16/2004 3:00:00 AM	350	150	3:30:00 AM	480	7:15:00 AM
4/17/2004 3:00:00 AM	350	170	3:30:00 AM	500	9:00:00 AM
4/18/2004 3:00:00 AM	360	170	2:30:00 AM	510	8:45:00 PM
4/19/2004 3:00:00 AM	350	150	3:30:00 AM	510	6:00:00 PM
4/20/2004 3:00:00 AM	360	160	3:45:00 AM	510	8:00:00 PM
4/21/2004 3:00:00 AM	370	160	3:00:00 AM	500	9:00:00 PM
4/22/2004 3:00:00 AM	360	170	3:00:00 AM	500	8:15:00 PM
4/23/2004 3:00:00 AM	370	170	2:30:00 AM	420	7:30:00 PM
4/24/2004 3:00:00 AM	380	160	4:00:00 AM	500	9:15:00 AM
4/25/2004 3:00:00 AM	380	160	4:00:00 AM	490	10:15:00 AM
4/26/2004 3:00:00 AM	350	170	2:45:00 AM	510	8:00:00 PM
4/27/2004 3:00:00 AM	350	160	3:00:00 AM	490	5:45:00 PM
4/28/2004 3:00:00 AM	360	160	3:30:00 AM	490	9:15:00 PM
4/29/2004 3:00:00 AM	400	180	3:15:00 AM	640	12:15:00 AM

	Average Flow Rate (gpm)	Minimum Flow Rate (gpm)	Time of Minimum Flow Rate	Maximum Flow Rate (gpm)	Time of Maximum Flow Rate
	360	150	4/16/2004 3:30:00 AM	640	4/30/2004 12:15:00 AM
	Total				
	7357556.6 gal				

Convert graphical data to tabular with one click. Statistical functions are summarized beneath each column. Flowlink scales tables to your printed page.

Sampler Compatibility

Integrate data from Isco's 6700 Series, or Avalanche samplers, with flow meter data for comprehensive analysis and reporting.



Upper pane shows level, flow rate and rainfall. Lower pane shows events (blue triangles) for each sample, with stream water and sample temperatures. Conductivity, pH, dissolved oxygen, etc., can also be displayed.

Flowlink 5 Computer Requirements

Operating System	Microsoft Windows 98, NT, 2000, and XP	Disk Drive	CD ROM
Microprocessor	133 MHz Pentium® or equivalent	Monitor	SVGA, 800 x 600 resolution
RAM	32 Mbytes[1] (recommended)	Printer	Color (recommended)
Hard Drive	100 Mbytes free space available for program data[2] (recommended)	Communication	Serial or USB[3] port with Isco Interrogator Cable, Hayes™ compatible telephone modem

[1] System must meet the minimum hardware requirements for the selected operating system.

[2] Estimate based on a database with 15 sites, each having 3 data sets (e.g., level, velocity, and flow rate), each set having a 15-minute reading interval, with the database archived every 6 months.

[3] Requires customer-supplied USB to RS-232 adapter/converter cable.

NOTE: A Flowlink 3 database can be opened in Flowlink 5 after conversion, using Isco's Site Converter software (included with Flowlink 5).

Water is life. Protect it.

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FAX: (402) 465-3022
e-Mail: info@isco.com
Internet: www.isco.com

Isco 730 Bubbler Flow Module

Bubbler level sensing provides the most accurate measurement

Isco 730 Bubbler Flow Modules use an internal air compressor to force a metered amount of air through a bubble line submerged in the flow channel. By measuring the pressure needed to force air bubbles out of the line, the water level is accurately determined. The 6700 Series or Avalanche Sampler then converts the level into flow rate.

The 730 provides accurate measurement in a variety of conditions. It is suitable for small channels, and it is not affected by wind, steam, foam or turbulence. And, because only the bubble tube contacts the flow, corrosive chemicals are not a problem. Automatic bubble line purging prevents clogging. The 730 also resists damage by lightning and debris, making it ideal for stormwater applications.

Automatic drift compensation makes Isco bubbler flow meters the most accurate level measurement technology. In standby applications, such as stormwater runoff monitoring, Automatic drift compensation also allows the 730 to maintain calibration for extended periods.

Applications

- Level and flow measurement in shallow streams, and/or where lightning and debris may occur
- Trigger sampling based on flow or level
- Flow-proportioned sample collection
- Treatment-capacity analysis
- River and stream gauging

Standard Features

- Bubbler line is unaffected by flow stream composition
- Automatic Drift Compensation provides high accuracy and maintains calibration in standby applications such as stormwater monitoring
- Built-in flow conversions for most applications, including weirs and flumes, Isco flow metering inserts, Manning formula, data points, or equation for special situations
- During the program's operation, current flow and level values are viewable on the sampler's LCD display
- All level data stored in the sampler is available for later retrieval, reporting, and graphing using Isco Flowlink® software

Simply plug in one of the environmentally-sealed modules to expand monitoring capabilities. They can easily be added or changed in the field.

Specifications

730 Module		
Size *(H x W x D)*	4.9 x 5.7 x 2.0 in	12.4 x 14.5 x 5.1 cm
Weight	1.5 lbs	0.7 kg
Material	Polystyrene	
Enclosure	NEMA 4X, 6	IP67
Power *(provided by 6700 Series Sampler)*	9 to 14V DC	
Program Memory	Non-volatile, programmable flash; can be updated via interrogator port on 6700 Series Sampler using a PC	
Level Measurement Data Storage Interval *(programmable through 6700 Series Sampler)*	1, 2, 5, 10, 15, or 30 minutes	
Operating Temperature	32° to 120°F	0° to 49°C
Storage Temperature	0° to 140°F	-18° to 60°C

Bubbler				
Range	0.01 to 10 ft.		0.003 to 3.05 m	
Level Measurement Accuracy	**Level***	**Error**	**Level***	**Error**
Linearity, Repeatability, and Hysteresis at 77 °F (25 °C)	0.1 to 5.0 ft	±0.005 ft	0.03 to 1.52 m	±0.002 m
	0.1 to 7.0 ft	±0.01 ft	0.03 to 2.13 m	±0.003 m
	0.1 to 10 ft	±0.035 ft	0.03 to 3.05 m	±0.011 m
Temperature Coefficient	**Level***	**Error**	**Level***	
Maximum error over compensated temperature range (per degree of temperature change)	0.01 to 5.0 ft	±0.0006 x level x temperature change from 77°F	0.003 to 1.52 m	±0.00108 x level x temperature change from 25°C
	0.01 to 10 ft	±0.0005 x level x temperature change from 77°F *where level is measured in feet*	0.003 to 3.05 m	±0.0009 x level x temperature change from 25°C *where level is measured in meters*
Automatic Drift Correction	After a 5-minute warm up period, zero level is corrected to ±0.002 ft. (±0.0006 m) at programmed intervals between 2 and 15 minutes			
Operating Temperature	32° to 120°F		0° to 49°C	
Compensated Temperature	32° to 140°F		0° to 60°C	

**Actual vertical distance between the end of the bubble tube and the liquid surface.*

Ordering Information

Description	Part Number
730 Bubbler Flow Module	**68-6700-050**
730 Accessories	
Flow Metering Inserts	
6 in. (150 mm) Insert	**68-3230-005**
8 in. (200 mm) Insert	**68-3230-006**
10 in. (250 mm) Insert	**68-3230-007**
12 in. (300 mm) Insert	**68-3230-008**

Water is life. Protect it.

Teledyne Isco, Inc.
4700 Superior Street
Lincoln NE 68504 USA
Phone: (402) 464-0231
USA and Canada: (800) 228-4373
Fax: (402) 465-3022
E-Mail: info@isco.com
Internet: www.isco.com

Isco Product Data

Isco 674 Rain Gauge

Connects directly to 6712 and Avalanche™ Samplers, 4200 Flow Meters, and 4100 Flow Loggers

The Isco 674 Rain Gauge is a precision instrument that uses a tipping bucket design for rainfall measurement. It has an 8-inch diameter orifice and is factory-calibrated to tip at either 0.01 inch or 0.1 mm of rainfall. With a 674 Rain Gauge connected, an Isco flow meter or sampler will:

- Store rainfall data in internal memory for retrieval and analysis with Isco Flowlink® Software
- Activate sampling based on rainfall
- Plot graphs and print reports of rainfall data on the flow meter's built-in printer

The 674 rain gauge features a precision tipping bucket and 3-point leveling system for easy setup.

Applications

A 674 rain gauge connected to an Isco 6712 or Avalanche sampler is ideal for collecting rainfall data as well as runoff-triggered samples at remote monitoring sites.

- Stormwater runoff monitoring
- TMDL and Watershed surveys
- Inflow and infiltration studies
- cMOM and CSO/SSO programs (Sewer overflow monitoring and prevention)
- General rainfall measurement

Standard Features

- Three-point leveling and integral bubble level make it easy to align the rain gauge for maximum accuracy.
- Sapphire jewel bearings on the tipping bucket are spring-loaded to prevent damage to the bearings and ensure consistent operation over a wide temperature range.
- Screens cover all openings to prevent leaves, insects, and other debris from clogging the gauge.
- Included 50-foot cable connects directly to compatible Isco flow meters and samplers.

Isco 674 Rain Gauge Specifications

Type:	Tipping bucket
Compatible equipment:	Isco 6700, 6712, and Avalanche Samplers, 4200 Series Flow Meters, 4100 Series Flow Loggers
Connect cable:	50 ft. (15.2 m), 2 conductor with 4-pin plug
Bearings:	Spring-loaded sapphire jewel
Orifice Diameter:	8 in. (20 cm)
Sensitivity:	English - 0.01 inch; Metric 0.1 mm
Accuracy:	English - ±1% at 2 in/hour; +3%/-4% up to 5 in/hour Metric - ±1.5% at 5 cm/hour; +3.5%/-9% up to 13 cm/hour
Capacity:	English – 22 inches/hour Metric – 38 cm/hour
Output Signal:	Contact closure of at least 50 millisecond duration
Switch Type:	Hermetically sealed magnetic proximity switch. Normally open, 200V DC, 0.5 A maximum.
Height:	13 in. (33 cm)
Diameter:	9.5 in. (24 cm) (at mounting base)
Weight:	10 lbs. (4.5 kg)
Operating Temperature:	32° to 140°F (0° to 60°C)
Storage Temperature:	-40° to 140°F (-40° to 60°C)

The 674 Rain Gauge connects to any 6700 Series or Avalanche Sampler, 4200 Series Flowmeter, or 4100 Series Flow Logger. Rainfall data logged on the host instrument can be analyzed with Flowlink 4 Software.

Ordering Information

The 674 rain gauge includes a 50 ft (15 m) cable for connection to an Isco 6700, 6712, or Avalanche Sampler, 4200 Series Flow Meter, or 4100 Series Flow Logger. Specify English or Metric version.

Description	Part Number
674 Rain Gauge	
English - Tips every 0.01 inch of rainfall	60-3284-001
Metric - Tips every 0.1 mm of rainfall	68-3280-001

Isco, Inc.
4700 Superior Street
Lincoln NE 68504 USA
Phone: (402) 464-0231
USA and Canada: (800) 228-4373
Fax: (402) 465-3022
E-Mail: info@isco.com
Internet: www.isco.com

CDMA
Digital Cellular Modem System
Special Product Application #1489

TELEDYNE ISCO
A Teledyne Technologies Company

SPA Instruction Sheet
60-5314-626 Revision A

Overview

The CDMA digital cellular modem system from Teledyne Isco (part #60-5314-489) is designed for use with the 6700 Series Samplers (remote data access/commands, outgoing text messaging), and the 4100/4200 Series Flow Meters (remote data access only).

The system uses service providers Alltel, Verizon, and Telus (Canada)*.

Text Messaging

The digital text messaging function can dial out to up to 3 different phone numbers (from a single service provider) when an alarm condition has been met. The text message states which alarm condition has been met, and the phone number of the modem.

Remote Operation

You can call the sampler using a command program like Hyper Terminal and send commands such as: changing the sample rate/volume, starting/stopping a program, taking manual samples, etc. For a complete list of available remote commands, see "Computer Operation > Menu Control" in the Remote Operation section of the sampler's Installation and Operation Guide.

Antenna Options

One of 3 antenna types is included with your system, also specified when ordering:

- The **external, magnetic mount whip** antenna (part #60-5314-606) is 6 feet long and 3 inches tall. The external whip antenna is for general use, and is especially desirable when the system is stored within an enclosure.
- The **internal** antenna is useful in maintaining low visibility of the system.
- The **external "hockey puck"** antenna (part #60-5314-605) is 10 feet (3m) long, and used primarily in manhole applications.
  The antenna is buried next to the manhole, in a hole bored into the pavement, at a depth leaving the top of the antenna flush with the street.
  An adjoining hole is drilled through the manhole collar for the antenna's cable. To complete installation, fill the holes in with cement.

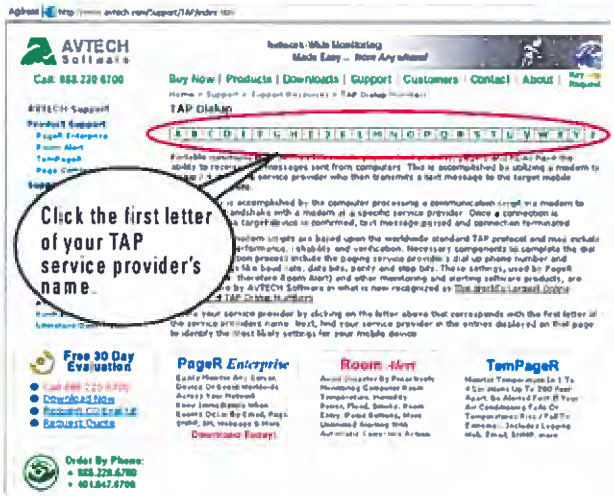
Sampler Programming

For alarm programming, see "Dial Out Alarms" in the Extended Programming section of the sampler's Installation and Operation Guide.

After the phone number(s) for dial out have been entered, the sampler display will prompt you to enter first the modem's phone number, then the TAP (Telocator Alphanumeric Protocol) service number, and then the parameter settings for that number (baud rate, data bits, parity, stop bits).

To program this information into the sampler, perform the following steps:

1. At the prompt, enter the phone number of the digital cellular modem.
2. To find your cell phone's TAP service number and parameter settings, go to **http://www.avtech.com/Support/TAP/index.htm**.



Click the first letter of your TAP service provider's name.

Figure 1: TAP Service Provider Screen Locating your service provider

3. Click on the letter corresponding with the first letter of the name of the service provider for your text message enabled hip phone.
4. On the next screen, locate your service provider's name in the left column and program the correct TAP number and parameters into the sampler.

*Additional service providers may be available. Contact the factory for information.

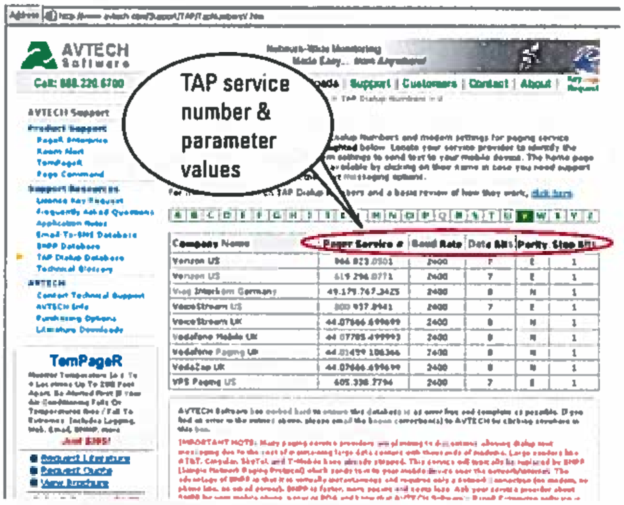


Figure 2: TAP Service Parameters Program phone number and parameters into your sampler

Installation

To install the cellular system:

1. Connect the modem to the interrogator port of the sampler or flow meter with the 10-foot cable provided with the system.

☑ Note

Connecting either the serial output or an interrogator cable to the sampler disables an internal modem, if one is installed.

2. Connect the antenna cable's SMA connector to the modem (if it is external).
3. Using a computer running Isco's Flowlink software and the baud rate set to 9600, call the system's modem to establish proper function.

Last modified December 5, 2005

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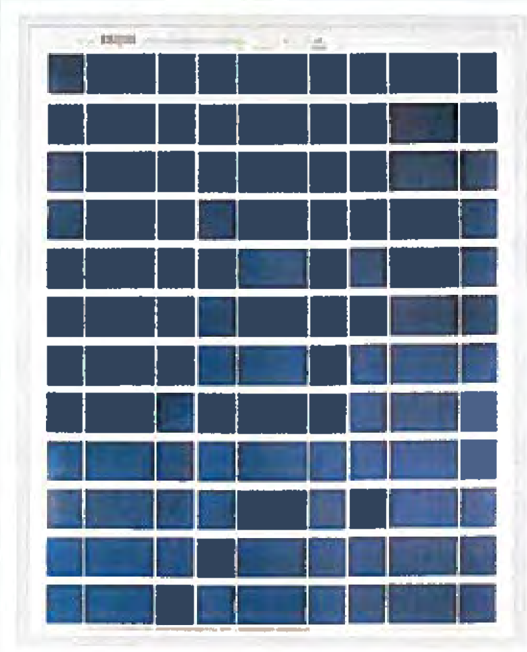


40W Photovoltaic module
40J

This line of modules is the direct result of over three decades of design, manufacturing and use. Attending to every detail in the design and manufacture of our products, our process controls and testing methods have optimized module life and electrical energy production.

Ameresco Solar's off-grid module line offers the following features and benefits:

▶ Built to last

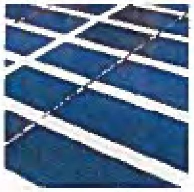
From mountaintops to off-shore platforms, on weather stations in the bitter cold of Antarctica and on telephone signal repeaters in the hot Australian outback, the technology has been proven in the harshest environments.

▶ Accessible junction box for off-grid connections

J-type junction box has accessible terminals for easier module interconnections in off-grid applications, and it allows fitting cable glands for various sections.

▶ Thick, durable scratch resistant back sheet

The thick back sheet provides extra insulation and increased resistance to protect your module against rough handling. Made of white polyester, it ensures longer term performance and increased energy production.



▶ High reliability

Cell interconnections and diode placement use well-established industry practice and are field-proven to provide excellent reliability.

▶ Quality and certifications

ISO 9001	ISO 9001 factory certification ensures that our manufacturing facilities use proven manufacturing and quality control processes.
VDE	Certified to IEC 61215 and 61730
ETL Intertek	Certified to UL1703 and ULC1703 Certified for use in Class 1, Division 2 Hazardous locations
CE	Conforms with European Directive 2006/95/EC

Photographs are intended to portray typical module appearance actual module appearance may vary.

40W PHOTOVOLTAIC MODULE - 40J

AMERESCO SOLAR
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Electrical characteristics

	(1) STC 1000W/m²	(2) NOCT 800W/m²
Maximum power (P_{max})	40W	29W
Voltage at P_{max} (V_{mpp})	17.9V	15.9V
Current at P_{max} (I_{mpp})	2.23A	1.83A
Short circuit current (I_{sc})	2.32A	1.88A
Open circuit voltage (V_{oc})	22.1V	20.1V
Module efficiency	11.4%	
Tolerance (P_{max})	±10%	
Nominal voltage	12V	
Efficiency reduction at 200W/m²	<5% reduction (efficiency 10.8%)	
Limiting reverse current	2.54A	
Temperature coefficient of I_{sc}	0.105%/°C	
Temperature coefficient of V_{oc}	-0.360%/°C	
Temperature coefficient of (P_{max})	-0.45%/°C	
(3) NOCT	47±2°C	
Maximum series fuse rating	6A	
Maximum system voltage	50V	
Application class (according to IEC 61730:2007)	Class C	

1 Values at Standard Test Conditions (STC): 1000W/m² irradiance, AM1 5 solar spectrum and 25°C module temperature

2 Values at 800W/m² irradiance Nominal Operation Cell Temperature (NOCT) and AM1 5 solar spectrum

3 Nominal Operation Cell Temperature Module operation temperature at 800W/m² Irradiance, 20°C air temperature, 1m/s wind speed

Mechanical characteristics

Solar cells	36 crystalline silicon cut cells connected in series
Front cover	High transmission 3.2mm (1/8th in) glass
Encapsulant	EVA
Back cover	White polyester
Frame	Silver anodized aluminum
Junction box	IP65 with 4 terminal screw connection block; accepts PG 13.5, M20 13mm (½") conduit, or cable fittings accepting 6-12mm diameter cable. Terminals accept 2.5-10mm² (8-14 AWG) wire
Dimensions	655 x 537 x 50mm / 25.8 x 21.1 x 2in
Weight	5.75kg / 12.7lbs

All dimensional tolerances within ±1% unless otherwise stated

Warranty*

- ▶ Free from defects in materials and workmanship for 2 years
- ▶ 90% min. power output over 12 years
- ▶ Optional 25 years available

* Refer to warranty document for terms and conditions.

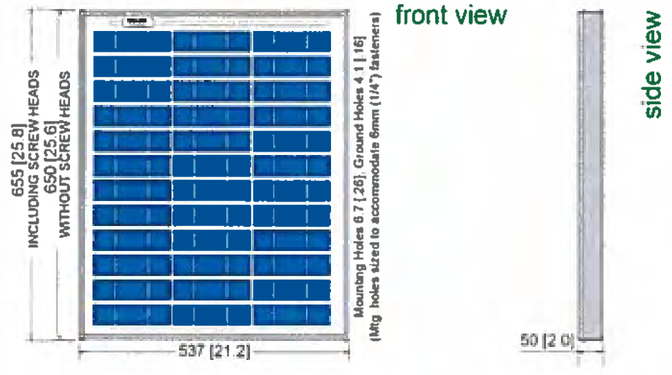
Certification

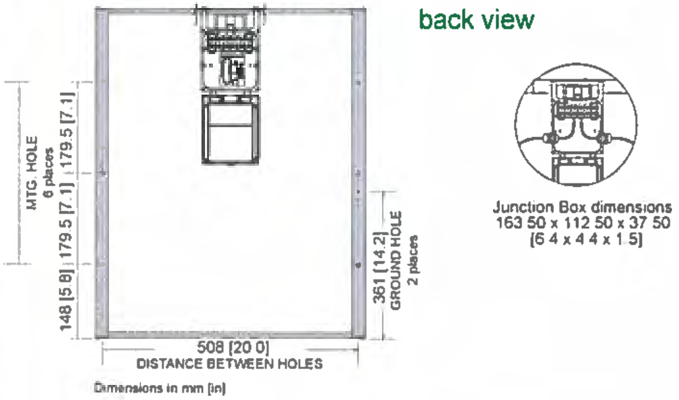
Certified according to the extended version of the IEC 61215 (ed 2), EN 61215:2005-08 (Crystalline silicon terrestrial photovoltaic modules - Design qualification and type approval).

Certified according to IEC 61730-1 and IEC 61730-2 (ed.1), EN 61730-1:2007-05 and EN 61730-2:2007-05. (Photovoltaic module safety qualification, requirements for construction and testing).

Listed to UL 1703 & ULC ORD-C1703 Standard for Safety by Intertek ETL. Class C Fire Rating.

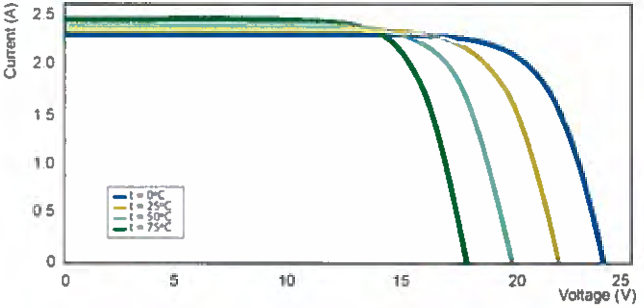
Approved by Intertek ETL according to FM 3611, Dec 2004, and according to CAN/CSA C22.2 No. 213-M1987, 1st Edition, Reaffirmed 2004, for use in a Class I, Division 2, Group A, B, C, D Hazardous (Classified) Location.



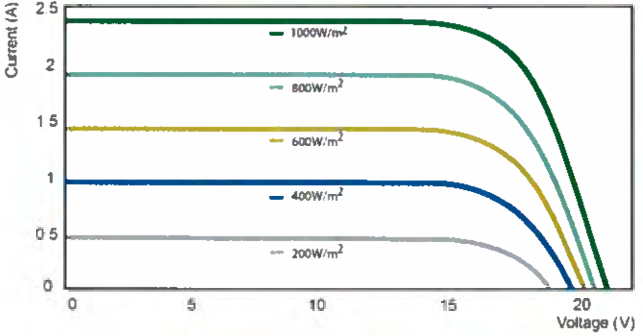


Junction Box dimensions
163.50 x 112.50 x 37.50
[6.4 x 4.4 x 1.5]

Temperature - dependence of performance



Irradiance - dependence of performance



For more information, call 855-43-SOLAR or visit www.amerescosolar.com.

This publication summarises product warranty and specifications which are subject to change without notice.

PS-4563-01-0/13 03 00 0

Appendix C

Checklists

Candidate Wet Weather Sampling Site Evaluation Checklist
And Data Collection Form
North Central Texas Council of Governments
Regional Wet Weather Characterization Program
Fall 2017

Date:__________________ Time: ______________

Location Name/Number:____

Nearest Cross Street/Location Description: ____

Entity (Circle One): Arlington Garland Irving Mesquite NTTA Plano

GPS Latitude/Longitude:_______________/_______________

Receiving Water: ____

Data for locating automated samplers:

Ease of Installation ~ Native or Existing Location / Bench ~ Need to construct Location / Platform / Base

Describe: ____

Ease of channel/sample area access and safety: ~ Describe either YES or NO

Describe: ____

____

Conveyance Information:

Conveyance Type & Size (Example: Unlined Channel, Grassy Swale, Open Channel Chute, etc.)

Describe: ____

____

Vegetative Cover ~ High ~ Medium ~ Low

Describe: ____

____

Visibility from the Right-of-Way ~ High Visibility ~ Low Visibility ~ None

Describe: ____

____

Public Access ~ Yes ~ No

Describe: ____

____

Evidence of Public Use – Yes – No (Circle all that apply, or describe)

Cans – Bottles – Paper – Food Products – Rubble – Wood – Brush – Graffiti – Transient Community

Describe: ____

____

Evidence of Normal Surface Water Elevation – Yes – No – Depth __________ inches/feet

Describe: ____

____

Perennial Flow Presence – High – Medium – Low – Depth __________ inches/feet

Describe: ____

____

Estimation of Automated Sampler, Sample Collection Criterion:

Estimate of maximum linear horizontal distance (in feet) of tubing needed to reach water ________
(Recommended to be less than 30 feet)

Estimate of maximum vertical distance (in feet) needed to collect sample ____________________
(Recommended to be less than 25 feet)

Other Site Features of Importance: ____

____

____

____

____

____

Notes: ____

____

____

____

____

____

____

____

Provide Site Visit Attendee Name(s) and Company/Entity:

____

____

____

____

Site Sketch(s):

(Provide a conveyance cross section, along with a plan view sketch. Include dimensions in feet. Use additional pages if necessary)

AERIAL VIEW

CROSS SECTION

Facing: Upstream / Downstream (Circle One)

NCTCOG STORMWATER SAMPLE COLLECTION
MOBILIZATION CHECKLIST

Municipality: (Circle One): Arlington Garland Irving Mesquite NTTA Plano

Date: ________________ Name(s) of sampling team:__________________

Confirm Qualified Storm Event		
1. Time since last rainfall (____ Days)		
2. Rain gauge & samplers functioning	Y	N
3. Rainfall amount ______ Rain gauge used ______		

Stations Active (List Stations Activated by Storm Event)

Arlington:
Garland:
Irving:
Mesquite:
NTTA:
Plano:

Gather Required Field Equipment				
☐ Field Equipment Box (Latex gloves, first-aid kit, see MP/QAPP)				
☐ Chain of Custody for Samples				
☐ Sample Collection Call (Atkins, Lab, Field Team)				
☐ Waders/Rubber Boots/Rain Coat/ High Visibility Vest				
☐ Digital Camera for Photo Documentation				
Containers, Labels and Ice for Samples	Grab (1) ☐	Comp (2) ☐	Comp (3) ☐	Comp (4) ☐
Temperature/pH/Conductivity meter calibrated?	Y	N		

Final Preparation		
1. Is severe weather forecast for site? (Check NOAA and Local Websites for details – i.e. www.noaa.gov, etc.)	Y	N
2. Notified Atkins office personnel of trip and return time?	Y	N
3. Notify lab?	Y	N

NCTCOG STORMWATER SAMPLE COLLECTION CHECKLIST

Date: ____________________ Name: ____

Station ID: ___________ Station Name: ____

Entity: (Circle One): Arlington Garland Irving Mesquite NTTA Plano

Current Field Conditions

- ○ Time begin sample collection activities: ______________

  Time end sample collection activities: ______________
- ○ Ambient air temperature: _________ °F
- ○ Current cloud condition:

  ☐ Fog ☐ High Clouds ☐ Partly Cloudy ☐ Cloudy ☐ Clear

  ☐ Other: ___________________________
- ○ Current weather condition:

  ☐ Sunny ☐ Light Rain ☐ Heavy Rain ☐ Snow/Sleet/Hail

  ☐ Windy ☐ Thunderstorms ☐ Severe Storms ☐ Other –
- ○ Construction activities w/n the drainage area: Y N
- ○ Observed rise: Y N

  ☐ Estimate: _________________________

Describe: ____

Comments: ____

____

Electronic Equipment Check
Sampler ☐ No error messages present (list error messages with comments) ☐ Sampling complete and sampler "disabled".
Rain Gauge ☐ Functioning and data recorded for duration of storm
Level ☐ Functioning and data recorded for duration of storm
Comment:

Grab Sample Documentation

Grab sample collected appropriately during first flush?	Y	N

Time collected: ________________ (e.g., 2100)

pH ________ Conductivity ____________ Temperature __________

*****If any of the following conditions are observed call or text 713-501-4569 immediately.*****

- pH outside of 6-9su range
- Conductivity less than 50 umhos/cm or greater than 500 umhos/cm\
- Abnormal temperature
- Abnormal color
- Oil sheen
- Odor: sewage, sulfur, sour, petroleum, natural gas

Estimated volume in grab bottle: ______________gal (at least 0.5 gal)

Qualitative description of sample characteristics:

☐ Turbid ☐ Clear ☐ Oil Sheen ☐ Debris ☐ Algae

☐ Other:

Sample bottles labeled and placed on ice?	Y	N

Comment:

Composite Sample Documentation

Sub-samples collected appropriately throughout storm duration?	Y	N

Time Collected
1 of 2 Bottle 2: ________________ (e.g., 2100)
2 of 2 Bottle 2: ________________ (e.g., 2100)
1 of 2 Bottle 3: ________________ (e.g., 2100)
2 of 2 Bottle 3: ________________ (e.g., 2100)
1 of 2 Bottle 4: ________________ (e.g., 2100)

Actual volume w/n 20% of expected volume?	Y	N

Qualitative description of the sample characteristics (can be more than one):

☐ Turbid ☐ Clear ☐ Oil Sheen ☐ Debris ☐ Algae

☐ Other:

Sample bottles labeled and placed on ice?	Y	N

Comment:

Rainfall Documentation

Time since last rainfall ________ days
Rainfall amount ________ in.
Rain gauge used ________________

Additional comments.

NCTCOG MAINTENANCE CHECKLIST
FOR MONITORING STATIONS

Municipality: (Circle One): Arlington Garland Irving Mesquite NTTA Plano

Date: ____________________ Name: ________________________________

Intake Port (when accessible):

- ☐ Tubing opening cleaned of debris.
- ☐ Sample tubing in good condition and anchored securely.
- ☐ Defective tubing replaced (as needed).
- ☐ Debris and sediment removed from the immediate vicinity of the intake port and along the tubing line.
- ☐ Sample strainer cleaned periodically with a brush.

At Sampling Station:

Sampler

- ☐ Sample container dismantled successfully.
- ☐ Connectors at the back of the controller capped tightly.
- ☐ Controller power cable connected.
- ☐ Tubing in contact with the peristaltic pump inspected and in good condition.
- ☐ Tubing replaced (as needed after 1,000,000 pump counts).
    - o Number of counts _______________.
- ☐ Sample tubing in good condition (no cracks, visible obstructions, kinks)
- ☐ Sample tubing joint connections in good condition (no leak)
- ☐ Programmable controller display and keyboard in good condition

☐ Sampler firmly plugged into power supply and receiving power

☐ Desiccant bag within the controller case inspected and recharged/ replaced (as necessary)

☐ Error messages reported by the sampler investigated and remedied

☐ Connections inspected to ensure that they are secure

Shelter

☐ Sampling shelter exterior inspected and in good condition (no cracks, vandalism, etc.)

☐ No debris/waste inside or around shelter

☐ Shelter door and lock operational

Rain Gauge

☐ Rain gauge clear of debris (if applicable)

☐ Connection to sampler in good condition (if applicable)

Cell Phone

☐ Cell phone antenna attached to shelter (if applicable)

☐ Connection to sampler in good condition (if applicable)

Temporary Power

☐ Battery sufficiently charged to complete one sampling event

☐ Battery connections tight to battery probes?

Equipment Calibration

☐ Bubbler level calibrated

☐ Sample volume calibrated

NCTCOG STORMWATER MONITORING
LABORATORY DELIVERABLES CHECKLIST

Date: ________________ Reviewer: ________________________

Municipality: (Circle One): Arlington Garland Irving Mesquite NTTA Plano

Event ID: *STATION ID-*__________

Hard Copy Deliverable

Cover Page

- ☐ The proper event ID, type of sample analyzed and date of report specified on cover

Results

- ☐ The proper event ID, contact, sample location, date laboratory received and laboratory contact specified on analysis results page
- ☐ Matrix specified is consistent with the sample taken
- ☐ Sample holding times consistent with MP/QAPP
- ☐ Laboratory analyses match analytes requested on COC
- ☐ Laboratory methods match methods requested in MP/QAPP
- ☐ Units reported match units requested in MP/QAPP
- ☐ Proper MDL/MAL achieved

Note exceptions:

Lab QA/QC

- ☐ The proper event ID and date of analysis specified on analysis results page
- ☐ Flagging criteria clearly defined
- ☐ QA/QC sample results are within acceptable levels
- ☐ Other QA/QC performed are acceptable (i.e. cone splitter blanks, etc.)

  List of other QA/QC items: ______________________________

Note exceptions and flagged samples:

Note exceptions and flagged samples:

Additional Material

- ☐ Proper COC copy attached
- ☐ Sample Protocol Nonconformance Worksheet attached, if applicable

Appendix D

Chain-of-Custody

800 106th Street
Arlington, Texas 76011

TTI ENVIRONMENTAL LABORATORIES

CHAIN OF CUSTODY RECORD

Page_____of_____
Telephone: (817) 861-5322
FAX: (817) 261-1717
www.ttilabs.com

CLIENT NAME: Atkins
CLIENT ADDRESS: 17220 Katy Freeway, Building 1, Suite 200
CITY, STATE, ZIP: Houston, TX, 77094
P.O. NO.:
CLIENT CONTACT: Chad Richards
PHONE: (281) 529-4200
FAX: (281) 493-1047
EMAIL: chad.richards@atkinsglobal.com
QUOTE NO.:
PROJECT NO.: 100060260
PROJECT NAME: NCTCOG RSWMP
SAMPLER'S NAME:

TEST PARAMETERS

Sample Collection					No. / Type Containers[2]																			
Date Ex:mm/dd/yyyy	Time Ex:hh:mm	(C)omp (G)rab	Matrix[1]	Sample Description	VOA	1 LT.	A/G	P/O	PRES[3]	E. coli	Oil and Grease	BOD5\COD\TSS\TDS	Tot. Pb/Tot. Zn/Tot. Cr	Tot. As/Tot. Cu	Diss. & Tot. P/Ortho P./Tot. N	Ammonia N./Nitrate N.	Atrazine				DRY WT	TRRP	HOLD[4]	TTI Lab ID
		C	W	A 3.7 L				G		✓	✓													
		C	W	B,C,D 3.7L				G				✓	✓	✓	✓	✓	✓							

LAB USE

LAB NO.

ON ICE ☐ YES ☐ NO

TEMP.OF COOLERS °C

3 | | 4 | >

CUSTODY SEAL

Cooler

☐ Y ☐ | ☐ Y ☐

SEAL INTACT

Cooler

☐ Y ☐ | ☐ Y ☐

TURNAROUND TIME:

☑ STANDARD 5 Business Days
☐ 50% RUSH 3 Business Days
☐ 100% RUSH 1Business Day / ASAP
☐ E.R. 300% RUSH Same Day / ASAP

[1] MATRIX: WW-Wastewater; W-Water; S-Soil; SD-Solid; L-Liquid; A-Airbag; C-Charcoal; SL-Sludge; O-O

[2] CONTAINERS: VOA-40ml vial; A/G-Amber or Glass 1 Liter; 4 oz-Glass Wide Mouth; P/O-Plastic or

[3] PRES.: 1-None; 2-1:1HNO$_3$; 3-1:1 HCL; 4-1:1 H$_2$SO$_4$; 5-NaOH; 6-Ice; 7-Other_____

[4] HOLD: Lab will hold samples for 30 (thirty) days.

Relinquished by (Signature)	Date	Time	Received By: (Signature)	Date	Time
Relinquished by (Signature)	Date	Time	Received By: (Signature)	Date	Time
Relinquished by (Signature)	Date	Time	Received By: (Signature)	Date	Time

REMARKS: ☐ TTI Drop Off ☐ TTI Pickup

Clients delivery of samples to TTI constitutes acceptance to reimburse TTI as per the terms and conditions listed in the price schedule.

Appendix E

Annual Flow Equations

Currently In Development

To Be Submitted Separately

Appendix F

Nearest Hospital Information

Station ID	Hospital	Directions
AR1801/1901	**Texas General Hospital** 2709 Hospital Blvd Grand Prairie, TX 75051 (469) 999-0000	1. Head southeast on E Copeland Rd toward Six Flags Dr 2. Slight right onto TX-360 Frontage Rd/N Watson Rd 3. Use the middle lane to turn left onto the ramp to E Abram St 4. Continue onto E Abram St 5. Turn right onto Osler 6. Turn left onto Howell 7. Turn right onto Stewart 8. Turn left at the 1st cross street onto Hospital Blvd Destination will be on the right
AR1802/1902	**Texas General Hospital** 2709 Hospital Blvd Grand Prairie, TX 75051 (469) 999-0001	1. Head north on S State Hwy 360 2. Use the left lane to take the ramp onto TX-360 N 3. Merge onto TX-360 N 4. Take the exit toward Abram St 5. Merge onto S Watson Rd 6. Turn right onto Prairie Oaks Dr 7. Turn right onto Osler Dr 8. Turn left onto Stewart Dr 9. Turn right at the 1st cross street onto Hospital Blvd Destination will be on the right
GA1801/1901	**Texas Health Presbyterian Hospital Dallas** 8200 Walnut Hill Ln Dallas, TX 75231 (214) 345-6789	1. Head south on N Shiloh Rd 2. Turn right onto Forest Ln 3. Keep left to stay on Forest Ln 4. Continue straight onto Skillman St 5. Continue straight to stay on Skillman St 6. Turn right onto Walnut Hill Ln 7. Turn left onto Main Cir 8. Enter the traffic circle Destination will be on the right
GA1802/1902	**Texas Health Presbyterian Hospital Dallas** 8200 Walnut Hill Ln Dallas, TX 75231 (214) 345-6789	1. Head east on Forest Ln toward S Garland Ave 2. Turn right at the 1st cross street onto S Garland Ave 3. Turn right onto W Kingsley Rd 4. Continue onto Walnut Hill Ln 5. Turn left onto Main Cir 6. Enter the traffic circle Destination will be on the right
GA1803/1903	**Baylor Scott & White Medical Center - Lake Pointe** 6800 Scenic Dr, Rowlett, TX 75088 (972) 412-2273	1. Head northeast on La Prada Dr toward Duck Creek Dr 2. Turn right onto Duck Creek Dr 3. Turn right onto Broadway Blvd 4. Turn left onto E Interstate 30 5. Use the left lane to take the ramp onto I-30 E 6. Take exit 64 for Dalrock Rd 7. Continue onto Dalrock Rd 8. Turn right onto Woodlake Dr 9. Turn left onto Scenic Dr 10. Sharp left to stay on Scenic Dr Destination will be on the right

IR1801/1901	**William P. Clements Jr. University Hospital** 6201 Harry Hines Blvd Dallas, TX 75390 (214) 633-5555	1. Head north on N Sowers Rd toward W Pioneer Dr 2. Turn left onto W Pioneer Dr 3. Turn right onto N MacArthur Blvd 4. Turn right onto W Airport Fwy 5. Use the left lane to take the ramp onto TX-183 E 6. Merge onto TX-183 E 7. Use the right lane to merge onto I-35E S 8. Take exit 432B for TX-356/Commonwealth Dr 9. Merge onto N Stemmons Fwy 10. Slight left toward N Stemmons Fwy 11. Turn left onto N Stemmons Fwy 12. Turn right onto Record Crossing Rd 13. Turn left 14. Turn left 15. Sharp left Destination will be on the right
IR1802/1902	**William P. Clements Jr. University Hospital** 6201 Harry Hines Blvd Dallas, TX 75390 (214) 633-5555	1. Head east on E Oakdale Rd toward S Nursery Rd 2. Turn left at the 1st cross street onto S Nursery Rd 3. Turn right onto E Shady Grove Rd 4. Use the right lane to turn slightly right onto E Irving Blvd 5. Slight right onto the TX-356 E ramp 6. Merge onto TX-356/Irving Blvd 7. Use the left 2 lanes to turn left onto Commonwealth Dr 8. Use any lane to turn left onto N Stemmons Fwy 9. Turn right onto Record Crossing Rd 10. Turn left 11. Turn left 12. Sharp left Destination will be on the right
MS1801/1901	**Dallas Regional Medical Center** 1011 N Galloway Ave Mesquite, TX 75149 (214) 320-7000	1. Head south toward New Market Rd 2. Turn left onto New Market Rd 3. Turn left onto S Beltline Rd 4. Continue straight onto S Bryan Belt Line Rd 5. Turn left onto Park Ln 6. Turn left onto N Galloway Ave Destination will be on the right
MS1802/1902	**Dallas Regional Medical Center** 1011 N Galloway Ave Mesquite, TX 75149 (214) 320-7000	1. Head east on Edwards-Church Rd toward Waterway Dr 2. Turn left onto Clay Mathis Rd 3. Turn left onto E Scyene Rd 4. Continue onto E Main St 5. Turn right onto N Bryan Belt Line Rd 6. Turn left onto Park Ln 7. Turn left onto N Galloway Ave Destination will be on the right
PL1801/1901	**Medical City Plano** 3901 W 15th St Plano, TX 75075 (972) 596-6800	1. Head west on W 16th St 2. Turn left onto Alma Dr 3. Turn right onto W 15th St/Norman F Whitsitt Pkwy 4. Turn right onto Coit Rd 5. Turn right 6. Sharp left Destination will be on the right
NT1801/1901	**Medical City Las Colinas** 6800 N MacArthur Blvd Irving, TX 75039 (972) 969-2000	1. Head northeast on State Hwy 161 N 2. Turn right onto N MacArthur Blvd 3. Turn left Destination will be on the right

NT1802/1902	**Texas General Hospital** 2709 Hospital Blvd Grand Prairie, TX 75051 (469) 999-0000	1. Head north on Robinson Rd 2. Slight left toward State Hwy 161 S 3. Turn left onto State Hwy 161 S 4. Turn right onto W Marshall Dr 5. Turn right onto S Great SW Pkwy 6. Turn left onto Hospital Blvd Destination will be on the left

Appendix C:
Monitoring Program and Quality Assurance Project Plan for:
Bioassessments: 2018-2022

Innovative approaches
Practical results
Outstanding service

REGIONAL WET WEATHER CHARACTERIZATION PROGRAM PERMIT TERM FOUR

MONITORING PROGRAM AND QUALITY ASSURANCE PROJECT PLAN FOR BIOASSESSMENTS: 2018–2021

Prepared for:

North Central Texas Council of Governments
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August 2018

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ACRONYMS AND ABBREVIATIONS

ALU	aquatic life use
cfs	cubic feet per second
DFW	Dallas-Fort Worth
DO	dissolved oxygen
EPA	U.S. Environmental Protection Agency
FNI	Freese and Nichols, Inc.
FSO	field sampling organization
GPS	global positioning system
mg/L	milligrams per liter
mL	milliliter(s)
mm	millimeter(s)
mS/cm	milliSiemens per centimeter
NBS	National Bureau of Standards
NCTCOG	North Central Texas Council of Governments
NRC	National Research Council
NTTA	North Texas Tollway Authority
PPE	personal protective equipment
ppm	parts per million
QA/QC	quality assurance/quality control
QAPP	quality assurance project plans
TCEQ	Texas Commission on Environmental Quality
TMDLs	total maximum daily loads
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks & Wildlife Department
TxDOT	Texas Department of Transportation
USGS	U.S. Geological Survey
YSI	Yellow Springs Institute

1.0 INTRODUCTION

1.1 BACKGROUND

Since biota respond to environmental conditions impacting them, biological assessments can demonstrate the impacts of individual stressors and the combined effects of different stressors. With this understanding, the National Research Council (NRC) report, *Urban Stormwater Management in the United States* (NRC, 2008), recommends including assessments of storm water management program progress with biological assessments of stream conditions. It also recommends that storm water management strategies should address all stressors to a stream.

Assessing the biological health of streams in the North Central Texas Council of Governments (NCTCOG) jurisdiction helps measure whether program goals of aquatic life use (ALU) protection are met. ALU attainment is based on evaluations of biological communities along with water quality and physical habitat conditions. Stream habitats are typically impacted by channelization and increased impervious surfaces along the shores in urban and suburban areas. These areas are frequently exposed to non-point source discharges that can directly or indirectly depress dissolved oxygen (DO) levels in the water, bury portions of the stream bottom with sediment, or create toxic conditions.

ALU assessments have not been performed on most unclassified streams. Texas Surface Water Quality Standards assign a high aquatic life use to all unclassified perennial streams that have not been assessed (Texas Commission on Environmental Quality [TCEQ], 2018a). Furthermore, some unclassified streams (i.e., urban streams) are stressed by many natural and anthropogenic factors interacting in complex ways. Biological monitoring or bioassessments help interpret the effects of these factors on the health and function of the streams. While water chemistry and channel morphology are important parts of the assessment, biological sampling provides a view of the cumulative effects of different environment factors.

1.1.1 Second Permit Term, 2005-2010

In the second permit term (2005–2010), the permit was administered by the TCEQ and implemented through NCTCOG and a consultant team led by Atkins. Approval was obtained to utilize in-stream stations for the regional monitoring program to more directly assess the impact of storm water within receiving streams. The revised program was termed the Regional Wet Weather Characterization Program (RWWCP) and was added as an option in Part IV.A.3 of the Texas Pollutant Discharge Elimination System (TPDES)

Municipal Separate Storm Sewer System (MS4) permits issued to the Phase I North Central Texas governmental entities. The primary goal of the in-stream monitoring program was to obtain baseline data on receiving streams in the Dallas-Fort Worth (DFW) metroplex for use in determining long-term water quality trends. Since the RWWCP language existed outside of each permit, it allowed greater flexibility for making changes to the program. During this second permit term, the North Texas Tollway Authority (NTTA) joined the regional program. All other participants remained the same, except for the Texas Department of Transportation (TxDOT)-Fort Worth District, who became a co-permittee with the cities of Fort Worth and Arlington and were no longer required to conduct wet weather monitoring. According to the original RWWCP protocol, municipal participants collected data from three sampling sites in the watershed (typically upstream, midstream, and downstream), and the transportation agencies collected data from two sites (upstream and downstream stations only). Samples were collected quarterly from each site during a qualifying rain event and were analyzed for 18 parameters.

As an added component, the City of Fort Worth selected the Representative Rapid Bioassessment Monitoring Option (Part IV.A.2) in their permit, which allowed the chemical sampling frequency to be reduced from four times per year per site to once per year per site. In its place, two bioassessments were conducted each year at a minimum of nine sites. These bioassessments were based on protocols developed by the U.S. Environmental Protection Agency (EPA). A summarization of this bioassessment data was included along with the chemical data in the annual regional monitoring report each year of the permit term.

1.1.2 Third Permit Term, 2011-2016

In the third permit term (2011–2016), the cities of Arlington, Dallas, Fort Worth, Garland, Irving, Mesquite, and Plano, together with the North Texas Tollway Authority and TxDOT-Dallas District agreed to continue their regional partnership and work cooperatively through the NCTCOG and Atkins to develop a revised RWWCP. This revised plan effectively monitored at least 50% of each entity's jurisdictional area by the end of the permit term. This extension of jurisdictional coverage allowed a reasonable assessment of each entity's jurisdictional watersheds while also achieving a balance among the various goals of obtaining valid scientific information, meeting permit compliance, and addressing what is practicable for each entity. The primary goal of the RWWCP during this permit term was to continue the assessment of urban impact on receiving stream water quality and to document any improvement presumably resulting from local Best Management Practice (BMP) implementation. The data collected during this permit term built upon the set of regional water quality data collected under the previous term needed for meaningful trend analysis. Since assessing the impact of urban runoff on receiving stream quality is a primary focus of this program, assessing the biological integrity of the streams was deemed fundamental in the third term. During the third term, 24 watersheds were chemically monitored and 12 watersheds were bioassessed across the region, with substantial overlap between the two sampling approaches.

At the end of the third permit term's sampling effort, a final summary report was prepared by Atkins to assess the sampling effort. The report found that in more than half of the watersheds sampled had high bacteria exceedances, with the average number of nine exceedances in these watersheds. Stream degradation was noted by Atkins' monitoring team in about half of the sampled watersheds based on the data analyzed, and additional monitoring was recommended at these sites.

The report analyzed each of the monitored watersheds, and looked at characteristics specific to each watershed. This approach provided more usable information for each entity, and each individual watershed's information can be reviewed and used to implement BMPs and other monitoring practices in the future. Many of the watersheds that were studied in the third term were classified as high priorities to be studied again due to the data was collected during the third term. The watersheds that were classified as high priority were generally those with stream degradation, those with high number of exceedances of criteria of monitored parameters, and those with existing total maximum daily loads (TMDLs).

Taking into account each watershed's characteristics and evaluating the RWWCP as a whole, Atkins made various recommendations for modifying the RWWCP in the next term, including the following that were applied to the proposal:

- Focus on Impaired Waterbodies –This suggestion is supported by TCEQ and EPA feedback provided to NCTCOG and the monitoring Participants. Atkins suggests a focus on monitoring impaired waterbodies will also help with TMDL efforts already underway in the area.
- Rapid bio-assessment improvements – Rapid bioassessments should continue to be part of the RWWCP, and entities that are not currently completing RBAs should be encouraged to do so.

Atkins recommends that the parameters that are recorded during bio-assessment chemical monitoring activities be expanded to include/match those of the wet weather monitoring to allow for easier comparison.

- Revise monitored pollutants: Pesticides and Herbicides – During the third permit term, Carbaryl was chosen to replace Diazaon that was undetected in the second permit term. Carbaryl was not detected in any watershed during the third permit term, and therefore was recommended that it no longer be monitored for the fourth permit term. Suggestions for replacement are dieldrin or atrazine.
- Revise monitored pollutants: indicator bacteria – Remove total coliforms from list of monitoring parameters. There is no recognized correlation between total coliforms and fresh water pathogens by TCEQ or EPA.
- Revise monitored pollutants: nutrients – Add ammonia nitrogen, nitrate nitrogen, and ortho-phosphate to the monitoring parameters for wet weather chemical monitoring. These additions would allow for better comparisons between bioassessment and wet weather chemical monitoring results.
- Revise monitored pollutants: metals – For the Duck Creek, Johnson Creek, and White Rock Creek (headwaters) subwatersheds, it is recommended that sampling of dissolved fractions of metals is conducted in order to determine the concentration of bioavailable metals.

Many of these recommendations were incorporated in the proposal for the fourth permit term.

1.1.3 Fourth Permit Term, 2018-2021

For the current permit term (2018 to 2022), the cities of Arlington, Dallas, Fort Worth, Garland, Irving, Mesquite, and Plano and the NTTA agreed to continue their regional partnership to work cooperatively through the NCTCOG to develop a revised regional monitoring program. TxDOT obtained a statewide permit incorporating both the Dallas and Fort Worth Districts, which removed the requirement to conduct wet weather monitoring. The revised regional monitoring program, which was approved by the TCEQ in 2017, incorporates the recommendations from the previous program outlined above.

The municipal regional participants proposed to continue to use a sampling plan that will effectively monitor at least 50% of their jurisdictional area by the end of the permit term. As in the previous term, in-stream watershed monitoring will be continued to obtain greater statistical robustness of the data by increasing the sampling at each location for a minimum of two years. The participants will maintain fixed sampling stations to the extent practicable. This will enable the data to be examined for trends and show improvements or decline in water quality within the fixed sampling period.

Watersheds that will be monitored were prioritized based on TMDLs and 303(d) streams, which were in watersheds that cover the jurisdictional area of the municipalities. Participants proposed to monitor in these impaired waterbodies in order to better assess the impacts of storm water on these impaired streams. It is primarily the same area monitored during the previous permit terms with some additional watersheds.

In October 2017, a consultant team led by Atkins and including subconsultants Freese and Nichols, Inc. (FNI) and Dougherty Sprague Environmental, Inc. was reselected to continue providing regional storm water monitoring services. Atkins will perform a variety of storm water monitoring compliance activities for the Cities of Arlington, Garland, Irving, Mesquite, and Plano, along with NTTA including storm water monitoring, bioassessments, and a BMP Analysis and Evaluation Plan. The bioassessment monitoring plan and BMP Analysis and Evaluation Plan will be provided in separate submittals. This document defines procedures for storm water sampling, sampling equipment and deployment, field trip preparation, sample retrieval, laboratory analysis, and post-sampling activities. Dallas and Fort Worth are part of the approved regional monitoring plan; however, this document is specific to the storm water monitoring activities for the cities of Arlington, Garland, Irving, Mesquite, Plano, and NTTA.

1.2 PURPOSE OF DOCUMENT

The purpose of this document is to fulfill the TPDES permit requirement held by Garland, Plano, and Irving to provide information to NCTCOG consulting staff on sample stations, equipment, personnel, and procedures to be used in bioassessments. It describes procedures to ensure data are adequate to support the assessment of stressor impacts. The goal of the bioassessments is to describe the aquatic communities of these streams and factors, including storm water runoff that may be impairing their ecological structure and function.

Both the EPA and TCEQ have an array of methods and approaches to use in bioassessments. Each has developed manuals outlining bioassessment methodology, but according to Barbour et al. (1999), protocols described are not "intended to be used as a rigid protocol without regional modifications. Instead, they provide options for agencies or groups that wish to implement rapid biological assessment and monitoring techniques."

1.3 ORGANIZATION OF DOCUMENT

This document includes sections addressing aspects of the monitoring plan for the project. All sections will be read and understood prior to initiating any monitoring activities.

Section 2.0 – Roles and Responsibilities: Roles and responsibilities of project personnel

Section 3.0 – Site Information: Sampling reaches and streams and rationale for their selection

Section 4.0 – Sampling Equipment: Description of sampling gear

Section 5.0 – Sampling Procedures: Procedures for field trip preparation, mobilization, and sampling

Section 6.0 – Sample Handling and Documentation: Sample handling and documentation procedures

Section 7.0 – Quality Assurance/Quality Control: Quality assurance procedures

Section 8.0 – Laboratory Analysis: Laboratory sample preparation and data reporting requirements

Section 9.0 – Post-Sampling Activities: Post-sampling activities

Section 10.0 – Data Analysis and Interpretation: Methods for data analysis and interpretation

Section 11.0 – Health and Safety: Procedures to ensure safety of field sampling personnel

Section 12.0 – References

2.0 ROLES AND RESPONSIBILITIES

The names and responsibilities of the organizations involved in the orchestration and implementation of the regional storm water monitoring program are described in this section.

2.1 MONITORING ORGANIZATION

The NCTCOG represents several municipalities in the greater Dallas-Fort Worth metroplex. Garland, Plano, and Irving are participating in the bioassessment monitoring.

2.2 MONITORING PLAN DEVELOPER

The monitoring plan was developed by FNI for Atkins. Atkins is responsible for:

- Reviewing and commenting on draft versions of the monitoring plan and helping FNI implement the monitoring plan.
- Helping NCTCOG coordinate bioassessment activities for Garland, Plano, and Irving.

2.3 FIELD SAMPLING ORGANIZATION

The Field Sampling Organization (FSO) will be the Atkins and FNI team. The FSO will execute the bioassessment activities defined in this monitoring plan. The FSO will conduct bioassessments based on protocols in the TCEQ *Surface Water Monitoring Procedures Manual* (TCEQ, 2012, 2014) and its updates (TCEQ, 2018b). These protocols are based in part on EPA rapid bioassessment methods (Barbour et al., 1999). The protocols involve assessment of ecological structure and function by sampling water quality, flow, habitat, fish, aquatic invertebrates, and other biota, including riparian vegetation and mussels. Indices of Biotic Integrity metrics will be calculated for fish and aquatic invertebrates. These indices will be compared to indices derived from reference streams in the same EPA ecoregion and published in TCEQ biological monitoring protocols (TCEQ, 2014) to help identify any degradation of those communities that has occurred. All sample locations are in the EPA's Level IV ecoregion, 32a Texas Blackland Prairie.

Metrics for fish and benthic macroinvertebrate community indices of biotic integrity will be calculated according to TCEQ (2014) protocols and compared to those illustrated in "Table B-5 Ecoregions 27, 29, and 32 Metrics" for fish and "Table B-11 Metrics and Scoring Criteria for Kick Samples" for benthic macroinvertebrates. This comparison will help identify any degradation of those communities that has occurred. If more current information is available about fish and benthic macroinvertebrate communities from reference streams in this ecoregion, which is the Texas Blackland Prairies Level IV ecoregion (32a), it will be considered in the comparison.

2.4 ANALYTICAL LABORATORY

The laboratory will assure the quality of its sample analysis and reporting in accordance with guidelines in Sections 6.0, 7.0, and 8.0 of this monitoring plan. The laboratory will also:

- Review monitoring plan/quality assurance project plans (QAPP).
- Verify samples delivered to the laboratory meet applicable QA requirements listed in the monitoring plan/QAPP.
- Process and prepare samples for analyses of the monitoring constituents listed in Section 4.1 of this monitoring plan.
- Analyze collected samples according to the methods listed in Section 4.1 of this monitoring plan.
- Conduct all necessary QA testing according to Section 7.2 of this monitoring plan.
- Report test results and QA data to Atkins and FNI according to Section 8.0 of this monitoring plan.

2.5 COMMUNICATIONS PROTOCOL

Communications between Atkins and the FNI bioassessment sampling team will be conducted by the Project and Task Managers or designated personnel. Managers and appropriate subcontractor staff will be copied on scope or policy issues along with day-to-day messages regarding the weather.

Communications to and from NCTCOG and the sampling teams will be conducted through Derica Peters (or delegate) and Chad Richards (Atkins) for regional monitoring-related items, including sampling activities and laboratory results. Designated staff will be copied on scope and policy issues.

Each field team will consist of one field team leader and one field assistant. The office leader will remain in communication with the field team leader and coordinate between the field team and laboratory as necessary. The office leader will remain aware of potential weather and traffic concerns and alert the field team as appropriate.

3.0 SITE INFORMATION

This section describes the sampling sites. Desired conditions for the sites include the presence of a variety of mesohabitats (a minimum of one pool and one riffle in each study reach), location as far downstream in the watershed as possible but within city limits; safe access for sampling personnel; locations for overnight water quality meters where they are not likely to be stolen or vandalized; and ease of access in moving large amounts of sample gear between the vehicle and stream. Reference sites will not be sampled since data collected during this study will be compared to values for metrics for indices of biotic integrity published from reference sites sampled in the same ecoregion (TCEQ, 2014).

3.1 GARLAND

3.1.1 Rowlett Creek Below Atchison Topeka and Santa Fe Railroad Bridge

Rowlett Creek, 200 feet downstream of its confluence with Spring Creek in Garland, Texas, will be sampled in 2018 through 2021 (Figure 3.1). This study reach begins where the Atchison Topeka and Santa Fe Railroad bridge crosses the creek and extends 2,600 feet downstream. The closest house or business to the creek in this reach is about 600 feet from the creek. In some areas, the forested riparian buffer extends more than 600 feet from the creek; however, in other areas there is no forested riparian buffer. This reach has a variety of mesohabitats, including riffles and pools. Much of the bottom is limestone bedrock (Figure 3.2). Much of the flow at this site is treated wastewater discharged to Rowlett Creek upstream of Garland.

Rowlett Creek was observed by Aaron Petty and David Buzan, FNI, and Mike Wilson, city of Garland, from the recommended study reach downstream to the Pleasant Valley Road bridge in Garland on May 10, 2018. Aaron Petty and David Buzan also observed the reach of Rowlett Creek downstream of Brand Road. The selected reach was chosen for the following reasons.

- This is the same reach sampled in 2014–2015 and sampling it maximizes comparability of habitats and data to be collected with data collected in 2014–2015.
- The selected reach has two meanders and the downstream reach does not have meanders.
- The U.S. Geological Survey (USGS) measures stream flow of Rowlett Creek in the selected reach. The provisional flow in Rowlett Creek on May 10, 2018, was 87 cubic feet per second (cfs).

Figure 3-1: Rowlett Creek Downstream of Spring Creek in Garland

Figure 3-2: Rowlett Creek Downstream of the Atchison Topeka and Santa Fe Railroad Bridge on May 10, 2018.
View is upstream towards Atchison Topeka and Santa Fe Railroad bridge. Photograph taken from the south shore (right bank).

- The selected reach is far enough upstream from Lake Ray Hubbard to minimize the probability of reservoir water quality or biological communities affecting samples and data collected in this study. A small waterfall up to 3 feet high is present downstream of the selected reach. The waterfall may partially block upstream movement of fish from Lake Ray Hubbard and will hopefully minimize the influence of reservoir fish on evaluations of the stream fish community.
- Much of Rowlett Creek downstream of Brand Road and downstream of the selected reach, which is wadeable, has smooth limestone bedrock bottom with little habitat variability.

3.2 PLANO

3.2.1 Rowlett Creek at Brown Branch

Rowlett Creek at Brown Branch in Oak Point Park and Nature Preserve upstream of E. Parker Road (Figure 3-3) will be sampled in 2018 and 2019. This location is on the east side of Plano. There are no bridges or dams for about 1.3 stream miles upstream of this site, which is buffered along most of both banks by a forested riparian zone in a public park. The flow on May 10, 2018 was estimated to be 15 cfs. The creek was relatively clear and had multiple riffles, runs, glides and meanders (Figures 3-4 and 3-5).

Figure 3-3: Rowlett Creek at Brown Branch in Plano

Figure 3-4: Rowlett Creek at Brown Branch in Plano on May 10, 2018.

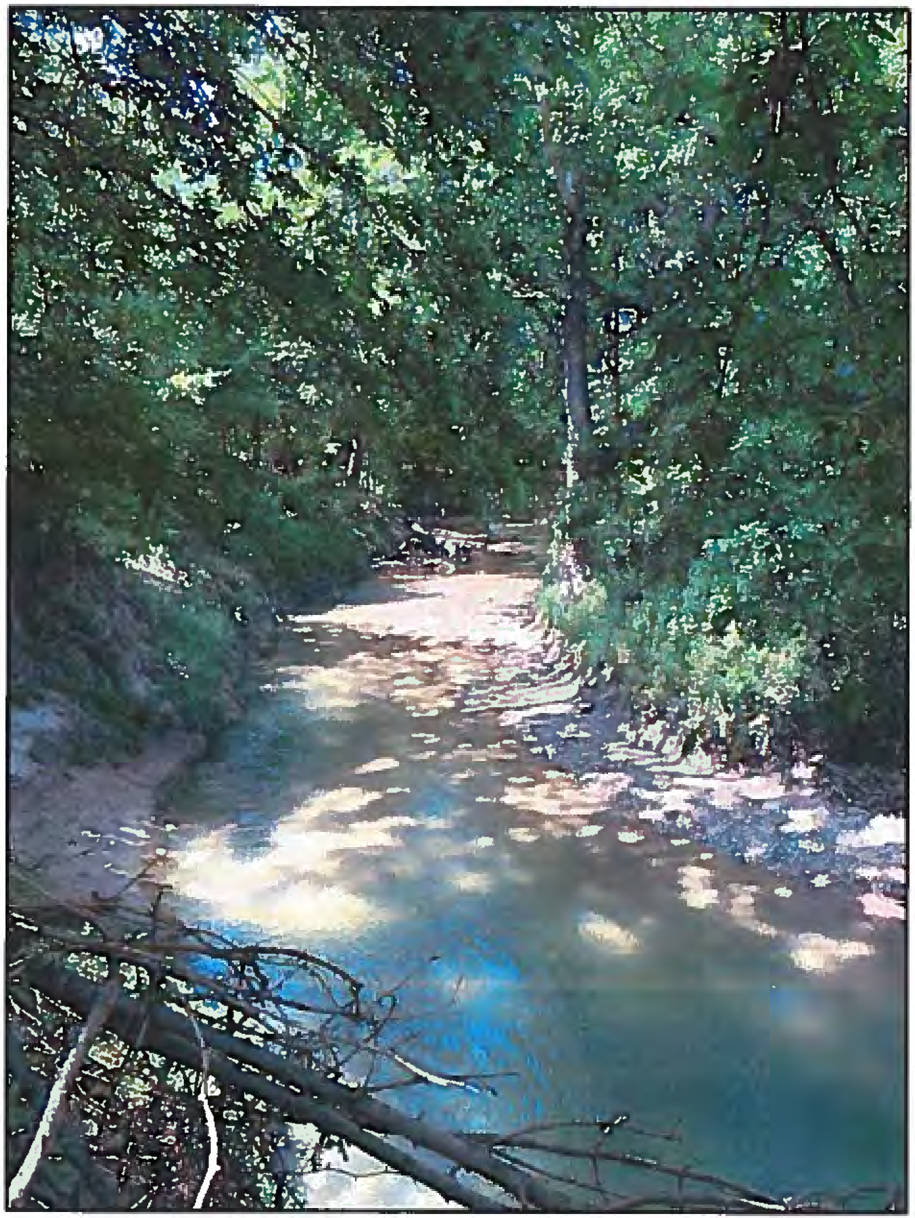

Figure 3-5: Rowlett Creek at Brown Branch in Plano on May 10, 2018.

3.2.2 Rowlett Creek at Headwaters

Rowlett Creek at Headwaters will be sampled in 2020 and 2021 in Suncreek Park downstream of S. Alma Drive in Plano (Figure 3-6). It was observed on May 10, 2018. Creek flow was estimated at 5 cfs and riffles, runs, and pools were present (Figures 3-7 and 3-8). Much of the creek has a loose gravel substrate in this reach with steeply incised banks. The creek is surrounded by riparian buffer for over 1.2 miles upstream from the proposed study reach.

Figure 3-6: Rowlett Creek at Headwaters in Plano

Figure 3-7: Rowlett Creek at Headwaters in Suncreek Park in Plano on May 10, 2018.

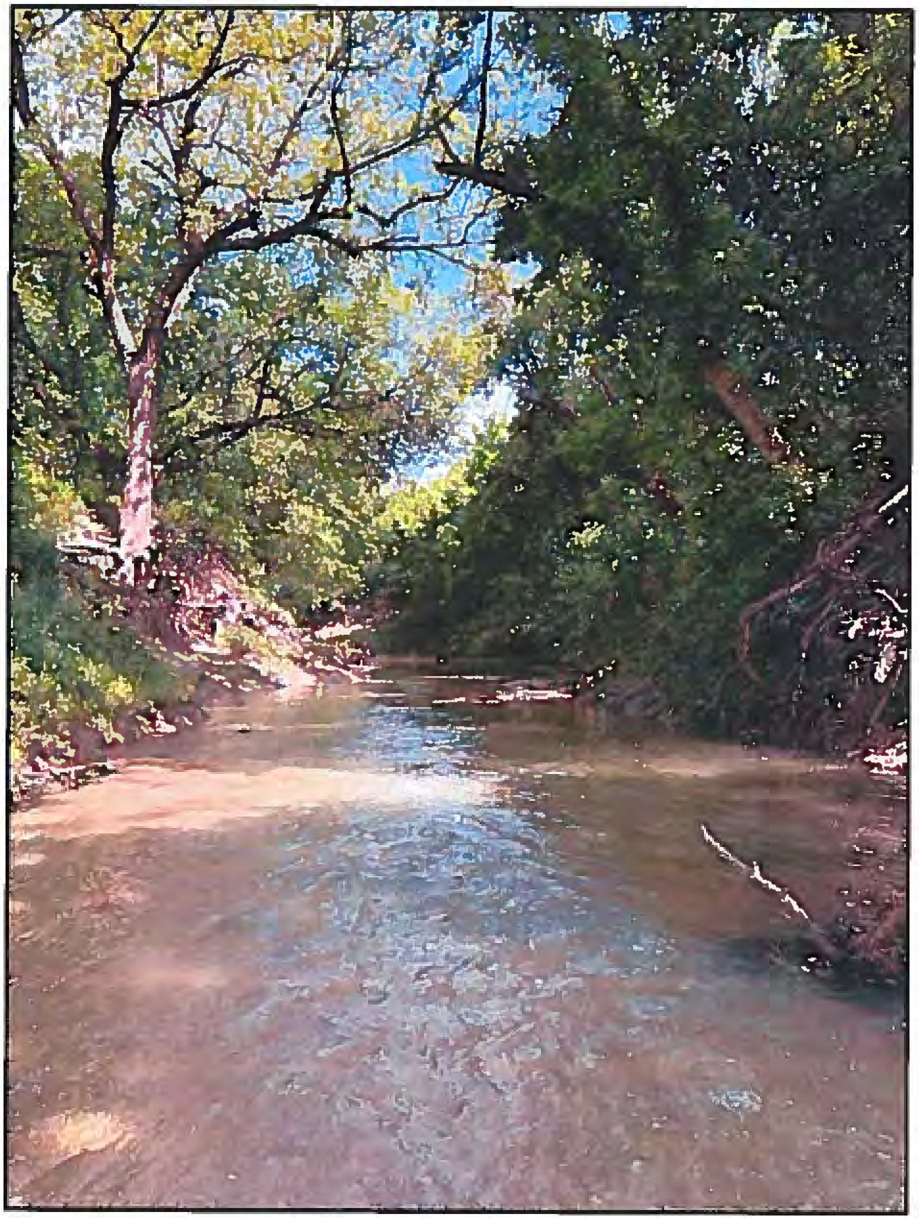

Figure 3-8: Rowlett Creek at Headwaters in Suncreek Park in Plano on May 10, 2018.

3.3 IRVING

3.3.1 Delaware Creek

Delaware Creek will be sampled in 2018 and 2019 in Fritz Park upstream of E. Oakdale Road in south-central Irving (Figure 3-9). It was observed on May 10, 2018. Creek flow was estimated at less than 1 cfs and riffles, runs, and pools were present (Figures 3-10 and 3-11). Review of aerial imagery in Google Earth suggests the creek may be intermittent at times at E. Oakdale Road about 1,000 feet downstream of the study reach. Much of the creek has a concrete rubble substrate in this reach with steeply incised banks. The creek is substantially modified beginning 0.5 stream mile upstream of the upstream end of the study reach. For several stream miles upstream, the creek is embedded in a trapezoidal concrete channel for long reaches and impounded in on-channel reservoirs in other reaches. There is limited riparian buffer along the east (left) shore and substantial riparian buffer along most of the west (right) shore in the proposed study reach.

Figure 3-9: Delaware Creek in Fritz Park in Irving

Figure 3-10: Delaware Creek in Fritz Park in Irving on May 10, 2018.

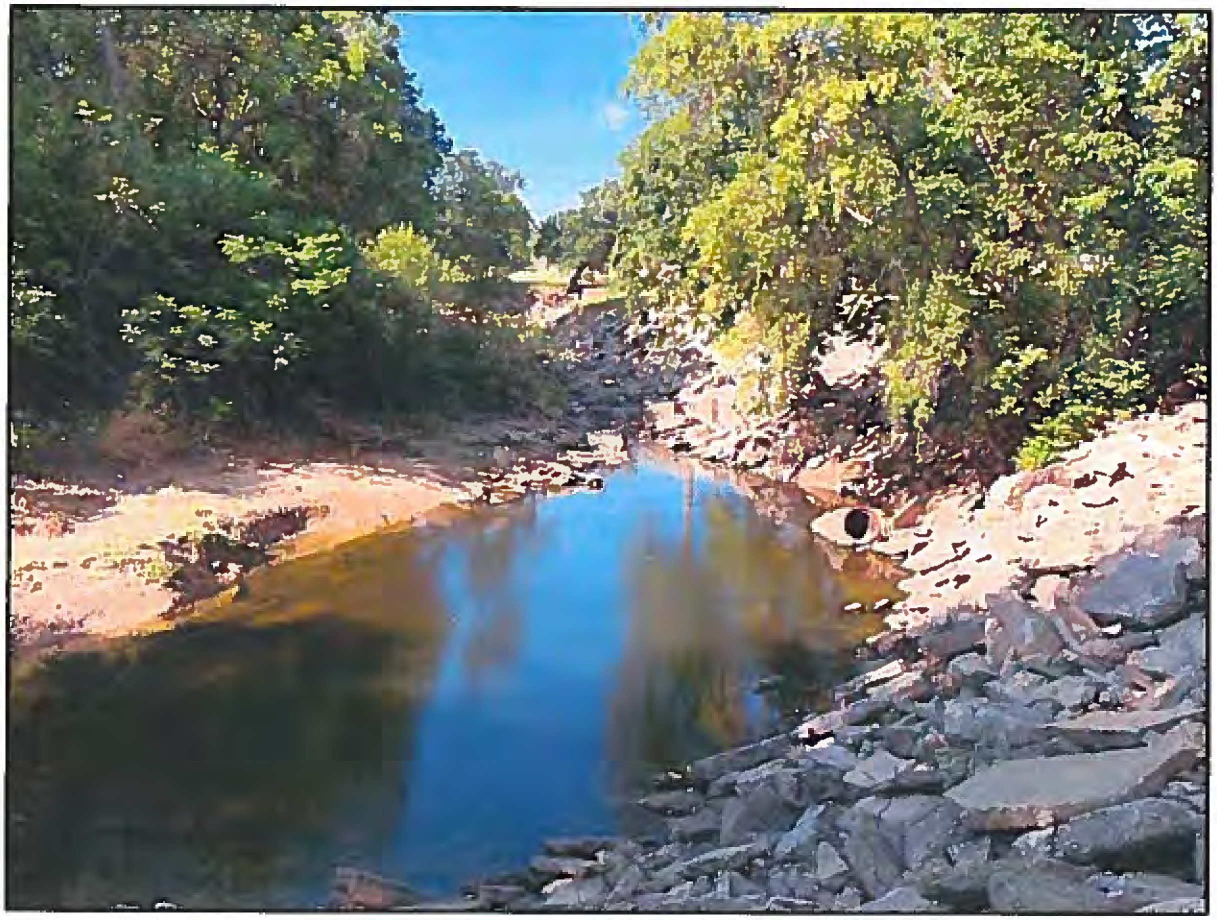

Figure 3-11: Delaware Creek in Fritz Park in Irving on May 10, 2018.

3.3.2 Estelle Creek

Estelle Creek will be sampled in 2020 and 2021 downstream of W. Pioneer Dr in southwest Irving (Figure 3-12). It was observed on May 10, 2018. Creek flow was estimated at less than 0.5 cfs, and riffles, runs, and pools were present (Figures 3-13 and 3-14). There are two concrete drop structures on the creek in the study reach. Review of aerial imagery in Google Earth suggests the creek may be intermittent at times in the study reach. The creek is impounded in an on-channel reservoir surrounded by apartment complexes for 0.4 stream mile immediately upstream of the study reach, and upstream from that reach it is confined to a trapezoidal concrete channel for another 1.3 stream miles upstream. Riparian buffer is limited along both banks of the creek.

Figure 3-12: Estelle Creek Downstream of W. Pioneer Drive in Irving

Figure 3-13: Estelle Creek Downstream of W. Pioneer Drive in Irving. View upstream towards upstream end of study reach.

Figure 3-14: Estelle Creek Downstream of W. Pioneer Drive in Irving

4.0 SAMPLING EQUIPMENT

The following sections describe equipment expected to be used. Maintenance and quality assurance/quality control (QA/QC) guidelines for equipment are in Section 7.0. It should be noted that a Texas Parks and Wildlife Department (TPWD) scientific collection permit will be kept with staff in the field, and the TPWD will be notified at least 24 hours prior to field sampling.

4.1 WATER QUALITY

A Yellow Springs Institute (YSI) water quality meter 6920 or equivalent will be used for the measurement of water temperature, DO, specific conductivity, turbidity, and pH at each station. The instrument(s) will be equipped with optical DO and turbidity probes.

Instantaneous grab samples for laboratory analysis of water chemistry will be taken using sample containers provided by the laboratory.

4.2 FISH

Fish will be collected with a combination of backpack electrofishing and seining. The backpack electrofisher employed will be a variable-voltage Smith-Root Model LR-24 battery-powered backpack unit or comparable unit. Electrofishing will be conducted throughout the entire wadeable reach established during the habitat evaluation. Personal protection gear required for electrofishing will include rubber gloves, chest waders, and life vests. Dip nets with insulated or fiberglass handles with 1/8-inch mesh will be used to collect stunned fish. Fish will be placed alive in a bucket of stream water for later processing.

A variety of seines will be available, including 10-foot x 4-foot x 1/8-inch mesh, 20-foot x 6-foot x 1/8-inch mesh, and 30-foot x 6-foot x 3/16-inch mesh seines. Choice of seine will depend on the habitat conditions, and different seines may be used.

Other gear required for fish sampling and processing will include a measuring board (1-millimeter [mm] increments) to measure fish length, preservative (10 percent formaldehyde), 1-gallon sample jars, and a camera. An electronic scale capable of measuring fish weight to the nearest gram will be available if needed. Field books/keys, including *Freshwater Fishes of Texas* (Thomas et al., 2007) and *An Annotated Checklist of the Freshwater Fishes of Texas, with Keys to Identification of Species* (Hubbs et al., 2008) will be used as a guide for identifying fish in the field. The following is a list of field equipment needed for fish sampling:

- Smith-Root Model LR-24 battery-powered backpack unit or equivalent equipped with anode ring pole and stainless-steel cable cathode;
- Dip nets with insulated or fiberglass handles equipped with 1/8-inch mesh;
- Rubber gloves;
- Rubber or neoprene waders;
- A minimum of one each of a 10-foot x 4-foot x 1/8-inch mesh, 20-foot x 6-foot x 1/8-inch mesh, and 30-foot x 6-foot x 3/16-inch mesh seines;
- Buckets or tubs: 2- or 5-gallon to carry and hold fish;
- 14-foot jon boat with motor and trailer;
- Paddles and life vests;
- Global Positioning System (GPS) unit to measure locations of sample collections and distances of seine hauls;
- Field forms and field notebooks to record data;
- Maps illustrating sample reaches;
- 10% formalin and jars to collect voucher specimens;
- Fish identification keys: minimum of *Freshwater Fishes of Texas* (Thomas et al., 2007) and *An Annotated Checklist of the Freshwater Fishes of Texas, with Keys to Identification of Species* (Hubbs et al., 2008);
- TPWD scientific collection permit;
- Measuring board (graduated in millimeters); and,
- Scale: capable of weighing fish to the nearest gram.

4.3 BENTHIC MACROINVERTEBRATES

Benthic macroinvertebrates will be collected with a 5-minute kicknet sample in a representative riffle at each site and preserved in the field with 70% ethanol. Sample analysis will be conducted by Jack Davis, subcontractor. The following is a list of field equipment needed for benthic macroinvertebrate sampling:

- Long-handled D-frame dip net equipped with 0.5-mm mesh net;
- Stopwatch to time sample collection;
- Sample tray, rinse bottle, and tweezers to review the sample and ensure adequate numbers of organisms are collected;
- Sample bottles, waterproof labels, and 70% ethanol for transporting organisms to the laboratory;

- GPS to record the location of benthic macroinvertebrate sample collection; and,
- TPWD scientific collection permit.

4.4 MUSSELS

Mussels will be qualitatively sampled while biologists are seining, electrofishing, kick-netting, measuring habitat, and collecting water samples. Sampling will involve observing the creek bottom while biologists are moving upstream and downstream. Some locations will be probed by hand to determine if mussels may be present.

4.5 HABITAT

Habitat assessments will be conducted during the first sample event each year at six transects across the stream. Tools used to describe habitat characteristics are listed in Table 4-1.

Table 4-1. Habitat Equipment List

Parameter	Equipment
Stream water width	Tape measure
Bank slope	Clinometer
Canopy cover	Densiometer
Geographic coordinates	Global positioning system unit
Depth	Wading rod
Flow	SonTek FlowTracker Handheld-ADV
Photographs	Digital camera
Water transparency	Secchi disk

5.0 SAMPLING PROCEDURES

Sampling procedures will be those described in TCEQ (2012 and 2014) unless modified for site-specific conditions.

5.1 SAMPLE TIMING

Each selected site will be sampled twice per year for two consecutive years. Rowlett Creek in Garland will be sampled twice per year for each of the 4 years. One sample at each site each year will be collected during the period from July 1 through September 30, referred to by the TCEQ (2012) as the "critical period." One sample is collected during this period because water temperatures are usually high and stream flows low compared to flows during most of the year.

Water's ability to contain DO is reduced as temperature increases. Therefore, DO levels may become critically low for aquatic life during warmer times of the year (i.e., summer). Summer aquatic plant growth may exhibit large swings in photosynthesis between day and night. Large swings in photosynthesis combined with greater amounts of aquatic plants in the summer can drop DO to very low levels in the early morning. Early morning declines in oxygen result from lack of photosynthetic oxygen production during the night combined with relatively high rates of oxygen consumption by aquatic plants and animals in the warm stream.

The second sample at each site each year will be collected during the period from March 15 through June 30 or October 1 through October 15, referred to as the "index period" by the TCEQ (2012). The TCEQ (2012) recommends bioassessment samples be collected when flows are at or only slightly above low flows.

The sampling schedule for this project is:

Garland

- Rowlett Creek downstream of Atchison Topeka and Santa Fe Railroad Bridge: Twice in 2018, 2019, 2020 and 2021

Plano

- Rowlett Creek at Headwaters (Suncreek Park): Twice in 2018 and twice in 2019.
- Rowlett Creek at Brown Branch (Oak Point Park and Nature Preserve): Twice in 2020 and twice in 2021

Irving

- Delaware Creek at Fritz Park: Twice in 2018 and twice in 2019
- Estelle Creek downstream of W. Pioneer Drive: Twice in 2020 and twice in 2021

5.2 NOTIFICATION

Contacts for the NCTCOG, Garland, Plano, Irving, and the Atkins project manager will be notified at least 7 days prior to each sampling event and be invited to participate to the extent they wish. TPWD Law Enforcement will be notified no more than 72 hours prior to, and no later than 24 hours prior to biological sample collection. If excessive rain or some other event beyond the control of sampling personnel forces cancellation of a sampling trip, contacts for the NCTCOG, Garland, Plano, Irving, and the Atkins project manager will be notified the same day the decision is made to cancel sampling.

5.3 SAMPLE LOCATION IDENTIFICATION

Upon arrival at the site, the sample team will scout the stream reach to be sampled from the shore. The upstream and downstream ends of the study reach will be marked with GPS. The study reach will extend at least 150 meters but no more than 500 meters. Habitat types and their locations will be noted along the study reach. The study reach should include at least one riffle and one pool. This first detailed reconnaissance of the stream will be used to determine locations for water quality, fish, benthic macroinvertebrate, mussel, and habitat sampling. The water quality sampling location will be immediately upstream of the reach in an area for safe, secure, water quality sampling.

5.4 WATER QUALITY

A precalibrated YSI Series 6920 water quality meter or equivalent will be placed in the stream at a secure location during the day to measure DO during the night and morning when DO values may decline to levels injurious to aquatic life. It will record data every 30 minutes. Temperature, specific conductance, pH, turbidity, and DO will be recorded every 30 minutes for the time extending through the biological and habitat sampling. A back-up calibrated water quality meter will be available to ensure data are collected during biological sampling in case the primary meter fails.

Field water quality (temperature, specific conductance, pH and DO) will be measured next to the meter deployed for 24-hour measurements. These measurements will be made when the 24-hour meters are deployed and again when retrieved and will be made with a calibrated water quality meter to document any drift in measurements of water chemistry made by the 24-hour meters.

Water chemistry samples for laboratory analysis will be collected in clean containers provided by the laboratory. Samples will be collected in the proximity of the YSI water quality meter at a location representative of stream quality. Samples will be collected at a depth of a foot where stream depth allows sampling without disturbing the bottom. Samples will be placed immediately on ice in an ice chest for transport to the laboratory. Water chemistry samples will be collected upstream of all other sample collection to avoid changes in water quality resulting from sampling, particularly from disturbed sediments.

Samples will be collected by submerging a clean sample container in a representative portion of the flowing stream to a depth of 1 foot. Parameters listed in Table 5-1 will be analyzed by the laboratory.

Table 5-1. Water Quality Constituents to be Analyzed

Constituent	Method	Detection Limit	Maximum Holding Time
E coli	SM9222D	10 colonies/100 mL	6 hours
Nitrogen as nitrate and nitrite	300A	0.03 ppm	48 hours
Phosphorus as orthophosphates	200.7	0.005 ppm	48 hours

5.5 FISH

Given the variability of habitats, flow regimes, and water chemistry, professional judgment will be used to assess sampling necessary to characterize fish assemblages. Fish sampling describes species present, their relative abundance, and external condition. Fish will be collected at each station using a combination of backpack electrofishing and seining. Fish will be sampled until no new species are collected. Habitats will include riffles, runs, glides, and pools. Sampling protocols described here are included in more detail in TCEQ (2014). Sampling will be conducted from the downstream end of the study reach toward the upstream end of the study reach. Fish will be sampled in each habitat type and combination of habitat types.

Electrofishing will be conducted throughout the habitats identified during the stream reconnaissance. Electrofishing will be conducted for a minimum of 15 minutes and continue until no new species are collected and all habitat types are sampled. All fish observed will be collected. Notes will be made on fish that escape capture. Sampling will be conducted from downstream to upstream to help prevent clouding the water and reducing visibility due to disturbing bottom sediments.

Seining will be used to sample pools up to approximately 6 feet deep, riffles, and runs that are free of debris. Seines of variable sizes will be used to accommodate the type of habitat sampled. As recommended by TCEQ (2014), a minimum of six seine hauls covering at least 60 meters will be conducted. Seining will continue until no new species are collected.

Fish will be identified in the field to the lowest taxonomic level practical. All individuals will be measured (total length) to the nearest millimeter. Any external anomalies on sampled fish will be recorded. Two voucher specimens of each species less than 1 foot long will be preserved in the field with 10% formalin. Voucher photographs will be collected of specimens, which can be visually and clearly identified to species in a photograph. Fish identification will be conducted by a degreed fisheries biologist knowledgeable in fish taxonomy.

5.6 BENTHIC MACROINVERTEBRATES

Benthic macroinvertebrates sampling will be collected from the riffle with the highest proportion of cobble/gravel substrate. A 5-minute kicknet sample will be collected by placing the straight edge of the net with 500-µm (0.5-mm) mesh firmly on the bottom downstream of the biologist. The biologist will vigorously disturb the substrate within 1 foot of the net so the water current carries invertebrates knocked loose from the bottom into the net. The biologist continues this effort, zigzagging back and forth and sampling all microhabitats in the riffle while moving upstream for 5 minutes.

The kicknet is then emptied into a tray, and a quick estimate of the number of organisms is made. The sample will be preserved in a labeled bottle with 70% ethanol containing a sample label on waterproof paper. If there are less than 140 organisms in the sample, another 5-minute kicknet sample will be collected and combined in the sample jar with the first sample. This process will continue as necessary until at least 140 organisms are in the sample bottle. The sample will be field-picked and preserved in a labeled bottle with 70% ethanol containing a sample label on waterproof paper.

Although preliminary reconnaissance indicates the presence of riffles at all sites, snags and accumulations of leaf litter will be checked and notes recorded on the types and relative abundance of benthic macroinvertebrates using those habitats.

5.7 MUSSELS

Qualitative sampling of mussels to determine if mussels are present, and if so, which species are present, will be conducted because of growing interest in native mussel populations and factors affecting their distributions. Fifteen of 52 known species in Texas are on the state-threatened list, and 6 are candidates for federal listing (TPWD, 2011a). Two state-threatened species, the Louisiana pigtoe (*Pleurobema riddelli*) and the Texas heelsplitter (*Potamilus amphichaenus*), are listed by TPWD as state threatened and possibly occurring in Dallas County. Relatively little is known about water quality requirements of these mussels. Since intensive sampling will be conducted at these locations, the presence/absence of mussels will be relatively easy to document. Their presence/absence may not significantly enhance interpretation of water quality impacts; however, considering the relatively minimal level of effort involved in sampling them, information gained will be helpful in understanding if conditions are suitable for mussels and indicating whether a state-listed species may be present.

The streambed, wherever visible, will be visually inspected for live and dead mussels. Hand-sampling will be conducted at each of the six habitat transect locations and at selected sites in the study reach considered possible habitat for mussels. Hand-sampling consists of sifting the substrate by hand. Depth, substrate type, and area sampled will be recorded for each sample point. The condition of collected mussels will be characterized according to TPWD (2011b) as:

- **Live**
- **Very recently dead** (soft tissue remains attached to the shell; in good condition essentially as it would be in a living specimen; internal and external colors are not faded)
- **Recently dead** (no soft tissue remains, but otherwise in good condition (looking like a living specimen that had been killed and cleaned); internally, nacre is glossy and without evidence of algal staining, calcium deposition, or external erosive effects; internal and external colors are not faded)
- **Relatively recently dead** (in good condition, but nacre is losing its glossy nature; algal staining, calcium deposition, and/or external erosive effects are evident on the nacre; internal and external colors often faded somewhat)
- **Long dead** (early signs of internal and external erosion, staining, calcium deposition, or some combination of these; most or all of the internal coloration and glossy nature has faded; epidermis with major sections absent, or if present, clearly aged and flaking)
- **Very long dead** (significant signs of erosion, staining, and calcium deposition more widely pronounced than above; coloration often faded white or nearly so; relatively little intact epidermis left; for specimens in erosive environments, internal and external features often weathered and smoothed, or otherwise exfoliated; shells often chalky, brittle, and crumbling)

- **Subfossil** (little or no epidermis; nacre faded white and entire shell often white; sometimes with signs of erosion, staining, or calcium deposition; typically chalky and powdery to the touch; shells often brittle and crumbling)

Live mussels will be photographed and returned to the same part of the stream from which they were collected. If mussel valves are found, they will be identified and photographed.

5.8 HABITAT

Habitat evaluations will be conducted on the first sample trip to each station each year according to TCEQ protocols (TCEQ, 2014). The first transect will be conducted at the downstream end of the reach. Five more transects will be measured equidistant from each other with the last transect at the upstream end of the study reach. If there are some habitat types not measured in one of the six transects, additional transects will be measured with a minimum of one transect in each mesohabitat (riffle, pool, run, glide) type available. The coordinates of each transect at the midstream point will be documented with a hand-held GPS unit. The points where each transect intersects the right and left banks will be marked with surveyor's tape, so those points can be revisited.

Each transect will be perpendicular to the stream channel and serve as an observation point for habitat characterization. Stream width, bank slopes, bank erosion potential, depth (at a minimum of 11 points across the transect and at the thalweg), habitat type (riffle, pool, run, or glide), substrate composition, aquatic plants, instream cover, tree canopy, and riparian cover will be measured and recorded for each transect. Observations of stream use, maximum pool depth, channel modifications, channel sinuosity, reach slope, and channel flow status will be made over the entire reach.

On the second sample trip in the same sample year, width of the stream at each transect will be measured, photographs taken of each transect, and observations made of the bank and canopy conditions. If best professional judgment indicates habitat conditions have substantially changed, all habitat measurements from the first sample trip will be repeated. Data will be recorded on standardized forms provided by TCEQ (2014).

Stream flow will be measured at each station during each sample event (TCEQ, 2012). A location within the stream, free of debris with relatively smooth channel morphology and laminar flow, will be selected to measure velocity. Velocity will be measured with a Sontek FlowTracker acoustic Doppler flow meter. Measurements of depth (to the nearest 0.1 foot) and velocity will be made at approximately equal flow intervals along a transect perpendicular to stream flow. If the channel is less than 10 feet wide, at least

10 velocity and depth measurements will be made. If the stream is greater than 10 feet wide, velocity and depth will be measured at between 20 and 30 points across the stream depending on shape of the streambed and the requirement to ensure no measurement section contains more than 10% of the total flow.

6.0 SAMPLE HANDLING AND DOCUMENTATION

This section describes the manner in which samples will be handled and tracked from the time of sample collection/retrieval to laboratory analysis.

6.1 SAMPLE DOCUMENTATION

Sample documentation will be recorded for each sample collected. Information in bold will be placed on sample labels as well as the field logs:

- Geographic coordinates
- Unique sample identifier (represented by the "Watershed, City")
- Time and date
- Sample collectors
- Depth at sample point
- Substrate type at sample point
- Mesohabitat type
- Preservative
- Method of collection

Collection information will be entered on water-proof field forms or directly into a database on a field computer. Observations relevant to sample collection conditions and location will be noted. Sample tracking logs will include sample label identifiers, dates, times, locations, and destination, and will be completed in the field.

6.2 WATER QUALITY

Water quality samples will be collected in clean, labeled, approved containers with appropriate preservative as provided by the analytical laboratory. Within 5 minutes of collection, all water samples will be placed on enough ice to lower water temperatures to less than 4 degrees Celsius °C) in less than 30 minutes and maintain water temperatures at or below 4°C until samples are delivered to the laboratory. Chain-of-custody forms will be completed and will accompany each sample to the laboratory. Samples will be delivered to the laboratory within the shortest holding time for any of the constituents.

Water quality meters, which have collected data overnight and in the morning, will be downloaded and post-calibrated in the field.

6.2.1 Chain-of-Custody

A chain-of-custody document must accompany each sample. Samples must be under the custody of field personnel until relinquished to a representative of the laboratory. A sample is defined as being under a person's custody if any of the following conditions exist: (1) it is in their possession, (2) it is in their view after being in their possession, (3) it was in their possession and they locked it up, or (4) it is in a designated secure area.

After the samples have arrived at the laboratory, they should remain under the custody of the laboratory.

Each person receiving or relinquishing custody of the samples must sign and date the chain-of-custody when transfer of sample custody occurs. Documentation of sample possession must include the following:

- Sample description/identification;
- Date and time of sample collection;
- Type of sample (composite or grab);
- Preservative used;
- Sample container type;
- Analyses required;
- Name of collector(s);
- Custody transfer signatures and dates and times of sample transfer from the field to transporters and to the laboratory; and,
- Bill of lading or transporter tracking number (if applicable).

Preformatted chain-of-custody forms will be used to document the transfer of samples to the laboratory and the analysis to be conducted on each bottle. A sample chain-of-custody is provided in Appendix A.

6.3 FISH

Most fish will be analyzed alive in the field and released after appropriate measurements are made. Collected fish will be held in buckets or tubs of water until fish sampling is completed. The following information from each sample of fish will be recorded:

- Number of each species of fish and external anomalies observed;
- Mesohabitat sampled;
- Sample gear;

- Length of seine haul, type of seine used, and time of electrofishing;

Two individuals (less than 1-foot-long total length) of each species will be retained as voucher specimens for 5 years.

Each fish sample will be analyzed for each habitat type in which it is collected. Each fish will be identified to species, counted, and observed for external anomalies. Some fish may be measured and weighed if it appears their length:weight relationship may deviate substantially from normal values.

Specimens that cannot be identified in the field will be preserved in the field and returned to the FNI Austin laboratory for identification.

Index of Biotic Integrity metrics will be calculated and compared to metric values in "Table B-5 Ecoregions 27, 29, and 32 Metrics" for fish (TCEQ, 2014). The metric values in Table B-5 (TCEQ, 2014) were calculated from reference streams for the same ecoregion from which samples will be collected.

6.4 BENTHIC MACROINVERTEBRATES

Benthic macroinvertebrate samples will be analyzed by Jack Davis, a qualified subcontractor with over 40 years of experience analyzing freshwater benthic macroinvertebrates in Texas. Laboratory analysis will include number of each taxon of benthic macroinvertebrates observed. Identification will be at least to genus, family, or order based on TCEQ (2014) guidance for rapid bioassessment samples. When possible, identification will be to the lowest taxonomic level possible. Index of Biotic Integrity metrics will be calculated and compared to metric values in "Table B-11 Metrics and Scoring Criteria for Kick Samples" (TCEQ, 2014). The metric values in Table B-11 (TCEQ, 2014) were calculated from reference streams.

6.5 MUSSELS

Live or dead mussels will be photographed, measured, and returned to the portion of the stream from which they were collected. Representative valves of dead mussels may be collected if necessary for identification. Representative specimens will be measured (valve length and height) and identified to species.

7.0 QUALITY ASSURANCE/QUALITY CONTROL

Data of known and documented quality are essential to the success of any monitoring or sampling program. Data quality objectives clarify the intended use of the data, define the type of data needed to support the decision, identify the conditions under which the data should be collected, and specify tolerable limits on the probability of making a decision error due to uncertainty in the data. Table 7-1 summarizes data quality objectives for the bioassessment field sampling. Data quality objectives are developed by data users to specify the data quality needed to support specific decisions.

The following sections provide the requirements for meeting data quality objectives. Specifically, these requirements are designed to ensure the quality of data collected in the field, preserve the integrity of samples in transit, and reduce errors in data processing.

Field personnel have used the bioassessment protocols outlined since 1990. Field personnel will review the relevant TCEQ (2012 and 2014) sampling protocols summarized in Sections 4 and 5 above. The same personnel will collect and analyze all data, which should minimize experimental error associated with different sampling personnel.

The first step in ensuring data quality is to collect samples under stable, normal spring to summer flow conditions. Flow will be monitored remotely by checking real-time flow data from the USGS gauge on Rowlett Creek at Sachse (USGS gauge 08061540) and the USGS gauge on Bear Creek in Grand Prairie (USGS gauge 0804956950). Sampling will be avoided to the extent possible when flows exceed the historical daily median flows at these locations by 50% of the daily median flow or within 4 days of the passage of a pulse that exceeded 15 times the daily median flow for the scheduled sample date. Collecting data at relatively stable low to normal flow conditions will help minimize temporary impacts to ecological conditions that can mask the evaluation of the biological community health.

Table 7-1. Data Quality Objectives

Parameter	First Year First Sample	First Year Second Sample	Second Year First Sample	Second Year Second Sample
Sample date	X	X	X	X
Sample time	X	X	X	X
Sample collectors	X	X	X	X
Fish community				
All species present	X	X	X	X
Percent abundance of each species in the fish community to the nearest percent	X	X	X	X
Percent of total fish with external anomalies	X	X	X	X
Photographs of external anomalies	X	X	X	X
Two voucher individuals for each species	Voucher specimens collected as necessary			
For each fish sample				
Mesohabitat sampled	X	X	X	X
Sampling effort (area seined or time electrofished)	X	X	X	X
Species collected	X	X	X	X
Number of each species collected	X	X	X	X
Index of Biotic Integrity	X	X	X	X
Benthic macroinvertebrate community				
Species present in riffle	X	X	X	X
Percent abundance of each species in the benthos	X	X	X	X
Index of Biotic Integrity	X	X	X	X
Two voucher individuals for each species	Voucher specimens collected as necessary			
Water quality (measured every 30 minutes from before midnight Central Standard Time through 10:00 a.m. the next day)				
Set of water chemistry samples for delivery to lab	X	X	X	X
Temperature ±0.15°C, reported to the nearest 0.1°C	X	X	X	X
pH ±0.2, reported to the nearest 0.1 standard units	X	X	X	X
Specific conductance, 0.001 mS/cm, reported to the nearest 0.10 mS/cm	X	X	X	X
DO ±0.2 mg/L, reported to the nearest 0.1 mg/L	X	X	X	X
Turbidity, ±2% of the reading or 0.3 NTU				
Secchi disk transparency, reported to the nearest centimeter	X	X	X	X
Flow, reported to the nearest 0.1 cfs	X	X	X	X
Mussels				
Species present and relative abundance by area or sample time	X	X	X	X
Habitat				
For each of a minimum of six transects and at least one transect in each mesohabitat				
Wetted stream width to the nearest inch	X	X	X	X
Left bank slope to the nearest degree*	X		X	
Right bank slope to the nearest degree*	X		X	
Left bank erosion potential, to the nearest percent*	X		X	
Right bank erosion potential, to the nearest percent*	X		X	
Habitat type*	X		X	
Dominant substrate*	X		X	
Right bank dominant riparian vegetation*	X		X	
Left bank dominant riparian vegetation*	X		X	
Macrophyte presence*	X		X	
Algae presence*	X		X	
Types of instream cover*	X		X	
Percent gravel to the nearest 10%*	X		X	
Percent instream cover to the nearest 10%*	X		X	

Parameter	First Year First Sample	First Year Second Sample	Second Year First Sample	Second Year Second Sample
Instream cover types*	X		X	
Width of natural buffer, right bank, to the nearest foot*	X		X	
Width of natural buffer, left bank to the nearest foot*	X		X	
Geographic coordinates at middle of transect*	X		X	
Stream depth at each of 11 points to the nearest 0.1 foot*	X		X	
Thalweg depth to the nearest 0.1 foot*	X		X	
Percent canopy to the nearest percent*	X		X	
Two photographs of each transect	X	X	X	X
Maximum pool width to the nearest inch	X		X	
Maximum pool depth to the nearest 0.1 foot	X		X	
Number of riffles	X		X	
Description of bank conditions in relation to the first event		X		X
Description of canopy conditions in relation to the first event		X		X
Number of bends in reach and characterization of each bend as well-defined or moderately well-defined	X		X	
Percent of channel bottom covered with water to the nearest 5%				

* Parameters with an asterisk may have to be sampled again during the second sample of the year if there has been substantial change in habitat.

7.1 WATER SAMPLES

The sampling team will not ship samples for weekend delivery to the water chemistry laboratory unless prior plans for such a delivery have been agreed upon with the sample control center.

Once a sample is collected, sample integrity is maintained through careful and controlled sample handling, storage, and preservation procedures. Samples are expected to remain in field sampling team custody until delivery to the water chemistry laboratory.

7.2 LABORATORY QUALITY ASSURANCE FOR WATER SAMPLES

TTI Laboratories (and/or their subcontracted laboratories) will analyze samples collected. The laboratory will certify the precision and accuracy of all analytical data and document all phases of sample handling, data acquisition, data transfer, report preparation, and report review.

7.2.1 Reference Materials and Reagents

Whenever possible, primary reference materials for instrument calibration, QC spikes, and performance evaluations will be obtained from the National Bureau of Standards (NBS) or the EPA. In the absence of available reference materials from these organizations, other reliable sources will be sought. Such secondary reference materials may be used for these functions provided that they are traceable to an NBS standard.

Laboratory reagent quality will be sufficient to minimize or eliminate detectable concentrations of analytes in laboratory blanks. Furthermore, reagents will not contain other contaminants that interfere with sample analysis.

7.2.2 Laboratory Data Management

A. Laboratory Data Collection

In addition to the data recorded in field logbooks and chain-of-custody forms, data that describe sample processing will be recorded in laboratory notebooks. Laboratory notebooks will contain the following information:

- Date of processing;
- Sample numbers;
- Case number;
- Analyses performed;
- Calibration data;
- QC samples;
- Concentrations/dilutions required;
- Instrument readings;
- Special observations; and.
- Analyst's signature.

B. Laboratory Data Logging

TTI Laboratories (and/or their subcontracted laboratories) will utilize an established system for sample check-in, tracking of samples through the laboratory, assignment of laboratory analyses, and sample check-out. The system will provide for management review of all laboratory data before the issuance of laboratory reports. The review will be accomplished on two levels: (1) review of raw data for each analysis, and (2) review of the final results to check for consistency or agreement of the results between all parameters.

C. Laboratory Data Reduction

For methods that utilize a calibration curve, sample responses will be applied to the linear regression line to obtain an initial raw result that will be factored into equations to estimate the concentration in the original sample. Rounding will only be performed after the final result has been obtained to minimize rounding errors. Copies of the raw data and the calculations used to generate the final results will be retained on file to allow reconstruction of the data reduction process at a later date if necessary.

At the completion of a set of analyses, all calculations will be completed and checked by the analyst. The associated QC data will be entered onto QC charts. If all data are acceptable, the data summaries will be submitted to the laboratory project manager for review. If QC samples do not meet acceptance criteria, the appropriate laboratory project manager will be notified and corrective action will be taken as specified in Section 7.2.3.

D. Laboratory Data Review

System reviews will be performed at all levels. The individual analyst will constantly review the quality of data through calibration checks, QC sample results, and performance evaluation samples. These reviews will be performed prior to submission to the laboratory project manager.

The laboratory project manager will review data for consistency and reasonableness with other data and will determine if QA/QC program requirements have been satisfied. Selected hard copy output of data, such as chromatograms and spectra, will be reviewed to verify that results were interpreted correctly. Unusual or unexpected results will be reviewed, and a resolution will be made as to whether the analysis should be repeated. In addition, the laboratory project manager will recalculate selected results to verify the calculation procedure.

7.2.3 Corrective Actions

An analysis will be considered to be out of control when it does not conform to the QA/QC protocols specified by this document, applicable methods, or standard operating procedures. When an analysis is out of control, the analyst who identifies the problem will document the occurrence and notify the laboratory project manager. The analyst, working with the laboratory project manager, will determine the cause of the problem and take appropriate corrective action. Analysis may not resume until the problem has been corrected. Restoration of analytical control will be demonstrated by generating satisfactory calibration and/or QC sample data.

Data generated concurrently with an out-of-control system will be evaluated for usability in light of the nature of the deficiency. If the deficiency does not impair the usability of the results, the data will be reported and the deficiency noted in the laboratory data report (e.g., a constituent is detected in a laboratory blank but not in sample analyses). Where sample results are impaired, the project manager will be notified. After the error has been corrected, the analysis will be rerun and the data can be reported. The laboratory project manager will outline the error and the corrective action in a QA report. If the cause of the error cannot be identified, the laboratory project manager will summarize the procedures and QA/QC used to analyze the sample and provide a statement of validity for the sample results.

Problems encountered during the field activities will be reported by the designated field staff as soon after discovery as possible. The Atkins project manager will be responsible for ensuring that corrective actions produce satisfactory results in a timely manner. Outcomes of those actions and their effect or potential effect on the data will be reported to Atkins and NCTCOG.

Results of performance or systems audits or internal QC analyses may trigger corrective action within the designated laboratory and Atkins project team. However, it is generally the responsibility of the laboratory analyst or field personnel to initiate laboratory or field corrective actions, respectively.

7.3 FIELD INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE REQUIREMENTS

All field equipment will be inspected prior to sampling to ensure it will collect accurate data of appropriate precision (e.g., electrofishers are operating correctly, nets are without defects, water quality meters properly calibrated, absence of contaminants). Inspection of field equipment will occur in advance of the field operation to allow time for replacement or repair of defective equipment. The field team will be equipped with proper backup equipment to prevent lost time on site in case of equipment failure in the field.

7.3.1 Water Quality and Flow Meters

The water quality meters and Sontek Flow Tracker flow meter will be inspected prior to sampling activities and the water quality meters calibrated within 24 hours of the start of sample collection.

7.3.2 Backpack Electrofisher

The Smith-Root Model Lr-24 is powered by a battery. The battery and back-up battery will be charged before sampling. Electric current is delivered through an anode ring pole and a "rat tail" cathode. Both electrodes should be inspected for electrolysis prior to sampling. If corrosion is present, electrode surfaces should be polished with an emery cloth or comparable abrasive. The electrofisher offers multiple voltage, duty cycle, and frequency settings. Operators will be familiar with the settings prior to field work. Since water resistance to electrical charge differs among waterbodies, settings should be tested at each stream to identify settings that maximize the number of fish collected.

Dip net handles used for electrofishing are made of fiberglass or insulated to prevent electrocution of sampling personnel. The dip net should be inspected for holes prior to deployment to avoid sample loss.

7.3.3 Seines

Seines will be inspected for holes prior to sampling and repaired as necessary.

7.4 SAMPLE LABELS

Adequate materials for labeling samples, including pre-printed sample labels on water-proof paper and pens with black indelible ink, will be prepared prior to traveling to the field. Each sample (i.e., collection of fish from a single location) will be double-labeled by affixing a sample label on the outside of the container and placing a label inside the container. All sample label entries will be made with black indelible ink. The sample label will accompany each sample through data entry. Each sample label will include the information described in Section 6.0.

7.5 DATA MANAGEMENT

Upon completion of sampling and sample analysis, all paper field records and chain-of-custody forms will be reviewed by the FSO for completeness and correctness. Any discrepancies in records will be reconciled with field personnel.

All data will be entered in an Excel spreadsheet. At least 10% of data entered will be checked for data entry errors. Data quality will be assessed by comparing entered data to original data or by comparing results with measurement criteria to determine whether to accept, reject, or qualify the data. Basic data retrievals will be made to review data and identify possible data entry errors. All computer files and paper records associated with the project will be archived until 5 years after project completion, approximately 2026.

8.0 LABORATORY ANALYSIS

TTI Laboratories (and/or their subcontracted laboratories; http://www.ttilabs.com/) in Arlington [(817) 861-5322] will be alerted when sampling is scheduled to begin so that the laboratory can prepare for receipt and analysis of samples. After sample collection, the laboratory will be informed that samples are being transported to the laboratory to allow them to have someone receive the samples and add preservatives if necessary and to begin necessary analyses within specified holding times.

8.1 LOST OR INADEQUATE SAMPLES

The laboratory will notify the FSO immediately if a sample is lost or is determined to be inadequate according to the communication protocol specified. The FSO will conduct a resampling effort for lost or inadequate samples.

8.2 DATA REPORTS

The laboratory will submit data reports via e-mail as electronic data deliverables in spreadsheet form. Laboratory data reports will contain final results for blanks and recoveries, methods of analysis, detection limits, quantification levels, accuracy and precision data, MS/MSD data, laboratory method and equipment blank data, and limits of instrument calibration. In addition, special analytical problems or modifications of specified methods will be noted. The number of significant figures reported will be consistent with the limits of uncertainty inherent in the analytical method. Consequently, most analytical results will contain no more than two significant figures. Concentrations in liquids will be expressed in terms of weight per unit volume (e.g., milligrams per liter [mg/L]). Reported detection limits will equal the concentration in the original matrix corresponding to the low-level instrument calibration standard after accounting for concentration, dilution, and/or extraction factors.

9.0 POST-SAMPLING ACTIVITIES

Upon return from sampling, the water quality meters will be post-calibrated within 24 hours, and their data downloaded to the Excel spreadsheet. Post-calibration will indicate if some data may be invalid because of meter drift. Invalid data will be excluded from the database, and a description of the reason for their exclusion will be provided. Photographs taken with the digital camera will be downloaded and labeled. Coordinates for sample points and routes will be downloaded from the GPS and placed into a Geographic Information System database.

Data on paper forms or in field computers will be entered in the Excel spreadsheet. Data management steps described in Section 7.5 will be followed to ensure final data meet data quality objectives.

Field equipment will be cleaned, post-calibrated, and repaired as necessary. Inventory of supplies and equipment will identify materials that need to be obtained prior to the next sample event. Field staff will review the sampling event and procedures and identify modifications that need to be made to the protocols for future sampling.

Voucher specimens will be preserved and labeled. If dead mussel shells have been collected, they will be identified to species.

10.0 DATA ANALYSIS AND INTERPRETATION

Metrics for fish and benthic macroinvertebrate communities will be calculated according to TCEQ (2014) protocols and compared to those illustrated in "Table B-5 Ecoregions 27, 29, and 32 Metrics" for fish and "Table B-11 Metrics and Scoring Criteria for Kick Samples" for benthic macroinvertebrates. This comparison will help identify any degradation of those communities that has occurred. If more current information is available about fish and benthic macroinvertebrate communities from reference streams in this ecoregion, which is the Texas Blackland Prairies Level IV ecoregion (32a), it will be considered in the comparison. Degradation of biological communities that is indicated by indices of biotic integrity will be evaluated by review of water quality, habitat, flow, land use, weather, and other sources of information as appropriate.

11.0 HEALTH AND SAFETY

11.1 BASIC SAFETY PREPARATION

Basic preparations will be routine before every sampling activity. At a minimum, a trip plan will be completed for each field trip and left at a designated location in the FNI office. The trip plan will include the following information:

- Field trip participants;
- Departure and estimated return times;
- Contact phone numbers; and,
- Basic itinerary, including where and when sampling will be performed.

Field work must be done in pairs. FSO field staff will consider carrying the following safety equipment during sample collection activities:

- Chest waders/hip boots/rubber knee boots;
- Safety vests and steel-toed shoes;
- Bug repellent;
- First aid kit;
- Cellular phone;
- Hat/sunscreen/sunglasses;
- Drinking water/sports drinks;
- Tool box with basic tools;
- Flashlights with spare batteries;
- Gloves;
- Antibacterial soap or hand cleaner;
- List of emergency phone numbers/office contacts.

The FSO will carry a packet of general safety information in each vehicle that contains the following materials:

- Emergency phone numbers; and,
- Picture identification cards, insurance information, and project identification sheets.
- Locations of emergency facilities (hospitals and police and fire departments)

- Work authorization from the NCTCOG

11.2 HAZARDS

FNI has developed and continually updates job safety instructions for known hazards and activities. FNI will issue instructions to field personnel and provide updated instructions as necessary as part of the health and safety documentation provided to field personnel.

11.2.1 Contaminated Water

Water collected from the stream reaches may be contaminated with pathogens and/or hazardous chemicals. Waterborne, disease-causing organisms (pathogens) are found in nearly all surface water systems. Some pathogens occur naturally while others enter surface water through untreated sewage discharges and bypasses, urban and agricultural runoff, and direct contact. To minimize the exposure to and effects from contaminated water, FSO field staff will maintain drinking water in a separate area from sampling activities. The FSO will carry antibacterial soap or hand cleaner on all field trips.

11.2.2 Heat Emergencies

Hyperthermia is caused by increasing body temperature due to exposure to extreme heat. Heat emergencies can be brought about by a combination of factors: physical exertion, clothing (waders), humidity, no breeze, air temperature, and the rate of fluid intake. Working in the extreme summer heat creates a very real threat of suffering from some form of heat-related stress.

Warning Signs: Chilling, headache, unsteadiness, dizziness, nausea, dry skin (either hot and red [heat stroke] or cool and pale [heat exhaustion]), rapid pulse, and muscle pain/spasms.

Treatment: General treatment for heat emergencies is cooling down and drinking plenty of fluids. A common symptom of dehydration is a headache. Heat stroke requires medical attention and is considered to be life threatening.

Prevention: Drink water in moderate amounts on a regular basis; do not wait until you are thirsty. Avoid alcohol, caffeine, and soda—these liquids are not water substitutes. Wear lightweight clothing and a wide-brimmed hat. Schedule activities that require the most exertion during early morning or late afternoon hours. Find some shade and take breaks during the day.

11.2.3 Ozone

FSO staff should be aware of the ozone alert level during summer months. On days with high ozone levels, FSO staff should be mindful not to overly exert themselves during sample collection activities.

11.2.4 Plants and Animals

Insects, reptiles, and certain plants are always potential hazards for field personnel. Tables 11-1 through 11-3 present a summary of general information on the most common plant and animal hazards encountered by field staff.

11.2.5 First-Aid Equipment and Supplies

A first-aid kit will be located within the vehicle located at the project sites during sample collection. The first-aid kit must include at a minimum: snakebite kit, potable distilled water, bandages, scissors or knife, antiseptic, bee sting kit, and allergic reaction to insect bite kit.

Other required procedures to reduce injury include:

- Confined entry will not be conducted.
- Stream reaches must not be entered below the water level during sample collection, during a rainstorm, or when rain is imminent. FSO field staff must be aware of flash flood warnings and remain in contact with FSO office staff.
- Appropriate lighting equipment will be carried to illuminate potential hazards. The stream banks may be muddy and slippery.
- Care must be taken when handling the heavy composite and grab containers.

11.2.6 Selection of Personal Protective Equipment

The selection of the personal protective equipment (PPE) will be done per site/field activity and after a thorough evaluation of the hazards involved at the site during each phase of the operation.

Recommended and required PPE is comprised of the following:

- Latex gloves when handling storm water samples
- Raingear
- Rubber boots
- Safety vest – reflective

- Coveralls or work clothing
- Work gloves

11.3 NEAREST HOSPITAL INFORMATION

Locations and information for the nearest hospitals for the various sampling sites are located in Appendix E of the Regional Storm water Monitoring Program: Monitoring Program and Quality Assurance Project Plan for Wet Weather Equipment Deployment and Sampling Protocol 2011-2016 (NCTCOG, 2012).

11.4 EMERGENCY CONTACT INFORMATION

Emergency contacts are listed below:

FIRE*	911
POLICE*	911
AMBULANCE*	911

* Local area police and fire will respond to a 911 call.

12.0 REFERENCES

Barbour, M. T., J. Gerritsen, B. D. Snyder, and J. B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

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______. 2018a. Texas Surface Water Quality Standards, adopted by the Texas Commission on Environmental Quality February 7, 2018. Chapter 307-Texas Surface Water Quality Standards, Rule Project No. 2016-002-307-OW. 212 pp.

______. 2018b. Updates to the Procedures for Surface Water Quality Monitoring. Accessed May 23, 2018. https://www.tceq.texas.gov/waterquality/monitoring/swqm_manualupdate.html.

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APPENDIX A
Sample Chain-of-Custody

800 106th Street
Arlington, Texas 76011

TTI ENVIRONMENTAL LABORATORIES

CHAIN OF CUSTODY RECORD

NELAP ACCREDITED TNI LABORATORY

Page ________ of ________
Telephone: (817) 861-5322
FAX: (817) 261-1717
www.ttilabs.com

CLIENT NAME: Freese and Nichols, Inc.
CLIENT ADDRESS: 10431 Morado Circle, Suite 300
CITY, STATE, ZIP: Austin TX 78759
P.O. NO.:
PROJECT NO.: 100060260
PROJECT NAME: NCTCOG RSWMP
SAMPLER'S NAME: Aaron Petty
CLIENT CONTACT: Aaron Petty
PHONE: (512) 617-3124
FAX:
EMAIL: aaron.petty@freese.com
QUOTE NO.:

TEST PARAMETERS

LAB USE
LAB NO.
ON ICE YES ☐ NO ☐
TEMP.OF COOLERS °C 3 | 4 | 5 | 6 | >6
CUSTODY SEAL Cooler ☐ Y ☐ N Samples ☐ Y ☐ N
SEAL INTACT Cooler ☐ Y ☐ N Samples ☐ Y ☐ N

Sample Collection Date Ex:mm/dd/yyyy	Time Ex:hh:mm	(C)omp (G)rab	Matrix[1]	Sample Description	No. / Type Containers[2] VOA	A/G 1 LT.	4 OZ.	P/O	PRES[3]	Phosphorus, in orthophosphate	Nitrogen, in nitrate and nitrite	E. coli									DRY WT.	TRRP	HOLD[4]	TTI Lab ID
		G	W	Rowlett Creek in Garland (below ATSF RR bridge)				2	6															
		G	W	Rowlett Creek at Suncreek Park, Plano				2	6															
		G	W	Delaware Creek at Fritz Park, Irving				2	6															

TURNAROUND TIME:
☑ STANDARD 5 Business Days
☐ 50% RUSH 3 Business Days
☐ 100% RUSH 1Business Day / ASAP*
☐ E.R. 300% RUSH Same Day / ASAP*

1. MATRIX: WW-Wastewater; W-Water; S-Soil; SD-Solid; L-Liquid; A-Airbag; C-Charcoal Tube; SL-Sludge; O-Oil
2. CONTAINERS: VOA-40ml vial; A/G-Amber or Glass 1 Liter; 4 oz-Glass Wide Mouth; P/O-Plastic or Other
3. PRES.: 1-None; 2-1:1HNO$_3$; 3-1:1 HCL; 4-1:1 H$_2$SO$_4$; 5-NaOH; 6-Ice; 7-Other________
4. HOLD: Lab will hold samples for 30 (thirty) days.

Relinquished by (Signature)	Date	Time	Received By: (Signature)	Date	Time

REMARKS: ☐ TTI Drop Off ☐ TTI Pickup

Please use an MDL of 0.005 mg/l for phosphorus (method 200.7)

Method 300A for nitrogen

Method SM9222D for E. coli

Clients delivery of samples to TTI constitutes acceptance to reimburse TTI as per the terms and conditions listed in the price schedule.

APPENDIX B
YSI 6920 Water Quality Meter

Search

(0) $0.00 (/my-profile/shoppingcart)

More

a xylem brand

MENU

Multiparameter Sondes

9

6920 V2-2 Multi-Parameter Water Quality Sonde

(javascript:void

(/ProductImages/303d90a6-c6be-

(javascript:void(0))

48b2-bab5-8ba85f73c975/images/YSI-6920-V2-Horizontal.jpg)

☐

6-Series Legacy Sondes

Water Quality Monitoring Sondes

View YSI 6-Series water quality sondes being used in a variety of water environments for long-term underwater monitoring and spot sampling.

Price: Request Pricing

Option: 6920 V2-2 Sonde with temperature/conductivity sensor

SKU: 6920V2-01

Request a Quote (/request-a-quote)

Compact Data Sonde for Unattended Monitoring

The YSI 6920 V2-2 sonde is an economical water quality logging system, ideal for long-term in situ monitoring and profiling. Real-time turbidity monitoring, dissolved oxygen monitoring, algae monitoring, and more.

Instrument only. Cables, probes/sensors, and accessories sold separately.

Overview ⊕

Specifications

The 6920 V2-2 has:

- 2 optical ports
- Conductivity/temperature port
- pH or pH/ORP port
- ISE port

General Sonde Specifications	
Medium	Fresh, sea or polluted water
Temperature - Operating	-5 to +50°C
Temperature - Storage	-10 to +60°C
Communications	RS-232, SDI-12
Software	EcoWatch®
Diameter	2.85 in, 7.24 cm
Length	18 in, 45.7 cm
Weight	4 lbs, 1.8 kg
Power - External	12 V DC
Power - Internal	8 AA-size alkaline batteries
Certifications	CE, EU Battery Compliance, FCC, IP-67, WEEE, and MCERTS; Assembled in the USA

Sensor Specifications	Range	Resolution	Accuracy
ROX™ Optical Dissolved Oxygen• % Saturation	0 to 500%	0.1%	0 to 200%: ±1% of reading or 1% air saturation, whichever is greater; 200 to 500%: ±15% of reading

Sensor Specifications	Range	Resolution	Accuracy
ROX™ Optical Dissolved Oxygen• mg/L	0 to 50 mg/L	0.01 mg/L	0 to 20 mg/L: ± 0.1 mg/L or 1% of reading, whichever is greater; 20 to 50 mg/L: ±15% of reading
Conductivity•• 6560 Sensor‡	0 to 100 mS/cm	0.001 to 0.1 mS/cm (range dependent)	±0.5% of reading + 0.001 mS/cm
Salinity	0 to 70 ppt	0.01 ppt	±1% of reading or 0.1 ppt, whichever is greater
Temperature 6560 Sensor‡	-5 to +50°C	0.01°C	±0.15°C
pH 6561 Sensor‡	0 to 14 units	0.01 unit	±0.2 unit
ORP	-999 to +999 mV	0.1 mV	±20 mV
Depth - Deep	0 to 656 ft, 200 m	0.001 ft, 0.001 m	±1 ft, ±0.3 m
Depth - Medium	0 to 200 ft, 61 m	0.001 ft, 0.001 m	±0.4 ft, ±0.12 m
Depth - Shallow	0 to 30 ft, 9.1 m	0.001 ft, 0.001 m	±0.06 ft, ±0.02 m
Vented Level	0 to 30 ft, 9.1 m	0.001 ft, 0.001 m	±0.01 ft, 0.003 m
Turbidity• 6136 Sensor‡	0 to 1,000 NTU	0.1 NTU	±2% of reading or 0.3 NTU, whichever is greater**
Nitrate / nitrogen•••	0 to 200 mg/L-N	0.001 to 1 mg/L-N (range dependent)	±10% of reading or 2 mg/L, whichever is greater

Sensor Specifications	Range	Resolution	Accuracy
Ammonium / ammonia / nitrogen•••	0 to 200 mg/L-N	0.001 to 1 mg/L-N (range dependent)	±10% of reading or 2 mg/L, whichever is greater
Chloride•••	0 to 1000 mg/L	0.001 to 1 mg/L (range dependent)	±15% of reading or 5 mg/L, whichever is greater
Rhodamine•	0-200 µg/L	0.1 µg/L	±5% reading or 1 µg/L, whichever is greater

Blue-Green Algae Sensor Specifications	Range	Detection Limit	Resolution	Linearity
Blue-Green Algae Phycocyanin•	~0 to 280,000 cells/mL† 0 to 100 RFU	~220 cells/mL§	1 cell/mL 0.1 RFU	R2 > 0.9999**
Blue-Green Algae Phycoerythrin•	~0 to 200,000 cells/mL† 0 to 100 RFU	~450 cells/mL§§	1 cell/mL 0.1 RFU	R2 > 0.9999***
Chlorophyll• 6025 Sensor‡	~0 to 400 µg/L 0 to 100 RFU	~0.1 µg/L§§§	0.1 µg/L Chl 0.1% RFU	R2 > 0.9999****

• Maximum depth rating for optical probes is 200 feet, 61 m. Turbidity, Rhodamine, Blue-Green Algae (PC & PE) and Chlorophyll are available in a Deep Depth option (0 to 200 m). Anti-fouling optical probes have depth rating of 200 m.
•• Report outputs of specific conductance (conductivity corrected to 25° C), resistivity, and total dissolved solids are also provided. These values are automatically calculated from conductivity according to algorithms found in Standard Methods for the Examination of Water and Wastewater (ed 1989).
••• Freshwater only. Maximum depth rating of 50 feet, 15.2 m. 600 V2-2 has 3 ISE ports; not available on the 6600V2-4.

*In YSI AMCO-AEPA Polymer Standards.
**For serial dilution of Rhodamine WT (0-400 ug/L).
***For serial dilution of Rhodamine WT (0-8 µg/L).
****For serial dilution of Rhodamine WT (0-500 ug/L).

RFU = Relative Fluorescence Units
† Explanation of Ranges can be found in the 'Principles of Operation' section of the 6-Series Manual, Rev D.
‡ Sensors with listed with ETV logo were submitted to the U.S. EPA ETV program on the YSI 6600EDS. Information on performance characteristics of YSI water quality sensors can be found at www.epa.gov/etv (http://www.epa.gov/etv), or call YSI at 800.897.4151☎ (#) 800.897.4151☎ (#) for the ETV verification report. Use of ETV name or logo does not imply approval or certification of this product nor does it make any explicit or implied warranties or guarantees as to product performance.

§ Estimated from cultures of Microcystis aeruginosa.
§§ Estimated from cultures Synechococcus sp.
§§§ Determined from cultures of Isochrysis sp. and chlorophyll a concentration determined via extractions.

Specifications indicate typical performance and are subject to change.

Accessories ⊕

Reviews ⊕

Application Notes ⊕

Brochures and Catalogs ⊖

- 6-Series Multiparameter Water Quality Sondes | E23-10 (/File Library/Documents/Brochures and Catalogs/E23-6-Series-Multiparameter-Water-Quality-Sondes.pdf)
- Françias - Sondes Multiparametres Serie-6 Surveillance des eaux | E23-06-French (/File Library/Documents/Brochures and Catalogs/E23F-Francais-sondes-multiparametres-serie-6-surveillance-des-eaux.pdf)
- Deutsch - 6-Serie Multiparameter Wasserqualitats Messsonden (/File Library/Documents/Brochures and Catalogs/E23G-Deutsch-6-Serie-Multiparameter-Wasserqualitats-Messsonden.pdf)
- Japanese - 6-Series Multiparameter Water Quality Sondes | E23-10-Japanese (/File Library/Documents/Brochures and Catalogs/E23J-Japanese-6Series-Multiparameter-Water-Quality-Sondes.pdf)
- Water Monitoring Solutions | E58-07 (/File Library/Documents/Brochures and Catalogs/E58-Water-Monitoring-Solutions.pdf)
- 6-Series Anti Fouling Kits | E60-07 (/File Library/Documents/Brochures and Catalogs/E60-6-Series-Anti-Fouling-Kits.pdf)

- Source Water Monitoring Applications Capabilities and Solutions | E74-01 (/File Library/Documents/Brochures and Catalogs/E74-Source-Water-Monitoring-Applications-Capabilities-and-Solutions.pdf)
- YSI Vertical Profiler Brochure | E78-03 (/File Library/Documents/Brochures and Catalogs/E78-YSI-Vertical-Profiler-Brochure.pdf)
- HydroMet Water and Weather Monitoring Solutions Brochure | D86-02 (/File Library/Documents/Brochures and Catalogs/HydroMet-Monitoring-Brochure-D86-02-0516-.pdf)
- Surface Water Capabilities Brochure (/File Library/Documents/Brochures and Catalogs/Surface-Water-Capabilities-Brochure-E103-0416.pdf)
- Wastewater Catalog | W35 (/File Library/Documents/Brochures and Catalogs/W35-03-Wastewater-Catalog.pdf)
- Wastewater Water Quality Capabilities and Solutions | W35-03 (/File Library/Documents/Brochures and Catalogs/W35-Wastewater-Water-quality-capabilities-and-solutions.pdf)
- Groundwater Applications and Capabilities | W38-01 (/File Library/Documents/Brochures and Catalogs/W38-Groundwater-Applications-and-Capabilities.pdf)

FAQs ⊕

Guides ⊕

Infographics ⊕

Manuals ⊕

News Briefs ⊕

Specification Sheets ⊕

Technical Notes ⊕

Tips ⊕

You may also need

(/Accessory/id-606930/Carrying-Case-Large-Hard-sided)

(/Accessory/Id-6155/6155-Optical-DO-Membrane-Kit)

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APPENDIX C
SonTek Flow Tracker Handheld-ADV

24/7 Technical Support

PINE (/)

The equipment supply
& support people

Technical Support (24/7) : 800.301.9663 (tel:8003019663)

- CEMS & Protocol Gas ›
- Environmental Monitoring ›
- Health & Safety ›
- Motorized Rentals ›
- Non-Destructive Testing (NDT) ›
- Remote Visual Inspection (RVI) ›

SonTek FlowTracker Handheld-ADV

Equipment (/products/) /
Environmental Monitoring (/products/category/1001/environmental-monitoring/) /
Water Level & Flow Monitoring (/products/category/1169/water-level-and-flow-monitoring/) /
Water Flow Meters (/products/category/1195/water-flow-meters/) /
SonTek FlowTracker Handheld-ADV (/products/detail/10964/sontek-flowtracker-handheld-adv/)

Get Quote (/products/quote/10964/sontek-flowtracker-handheld-adv/)

Question? (/products/question/10964/sontek-flowtracker-handheld-adv/)

Overview Specifications

Technical Specifications

Velocity Range:	±0.001 to 4.0 m/s (0.003 to 13 ft/s)
Velocity Resolution:	0.0001 m/s (0.0003 ft/s)
Velocity Accuracy:	±1% of measured velocity, ±0.25 cm/s
Sample Volume Location:	10 cm from center transducer

Communication Protocol:	RS-232
Power Supply:	8 AA Alkaline batteries (25+ hours of continuous operation)
Weight:	4 lbs
Probe Width:	5.1\"
LCD/Keypad Unit:	Temporarily submersible to 1 m (3 ft)
Operating/Storage Temperature:	-20° to 50°C

CONTACT

✉ help@pine-environmental.com (mailto:help@pine-environmental.com)

☎ 800.301.9663 (tel:8003019663)

QUICK LINKS

Equipment (/products/)

Locations (/locations/)

Careers (/about/careers/)

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in (https://www.linkedin.com/company/pine-environmental-services/)

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APPENDIX D
Smith-Root LR-24 Electrofisher

LR-24 Electrofisher

The World's Most Advanced and Safest Electrofisher

You, a Fisheries Biologist, called for a lightweight backpack electrofisher with precise digital controls, "quick setup" options, and the ability to store and recall electrical settings. "Time in the field is valuable," said fisheries scientists, "and we want to efficiently capture fish while maintaining a safe work environment."

By engaging with fisheries scientists in the development process, Smith-Root engineers transformed the backpack electrofishing world when creating Smith-Root's LR-24 Backpack Electrofisher. Among many innovations, the LR-24 introduced digital controls, "quick setup" options, 10 programmable/recallable settings, electrical output monitoring, overload warning, customized shoulder harness, 400 Watt electrical output, and state of the art safety features.

Features

Quick Setup

Quick Setup will select a voltage level necessary to achieve 25 watts average power output through the water between electrodes. This setup uses a default setting of a pulsed DC waveform with a frequency of 30 Hz and a 12% duty cycle (equivalent to a 4ms pulse width). All settings can be adjusted up or down from this starting point to achieve levels necessary for fish capture. This is very useful when electrofishing in a new area and you're not sure what settings to use.

Dual Output

This feature allows the operator to set up two completely independent sets of waveforms and voltages and toggle between them simply by releasing and pressing the anode pole switch in less than one second. This can be very useful if working in waters with multiple age classes, or multiple species where the optimal settings may be quite different.

Safety Features

Emergency stop switch, twin audible alarms, tilt and immersion sensors and Anode-Out-of-Water sensor, combined with the ETL safety certification make the LR-24 the safest backpack electrofisher available. With the **ETL Listed Mark** on the LR-24 Backpack Electrofisher, researchers can be confident that they are using the safest backpack electrofisher in the world.

Power Limit Key and Power Limit Mode

The Power Limit Key allows the user to limit the maximum average output power. It is defaulted to 400 watts, which is the maximum average power output that the LR-24 is capable of producing. It can be easily changed to a lower limit, which can be useful if a study requires staying within a certain power level. The user can decide whether the frequency or the voltage will be automatically decreased in order not to exceed the output power at that limit.

Precise control over output settings

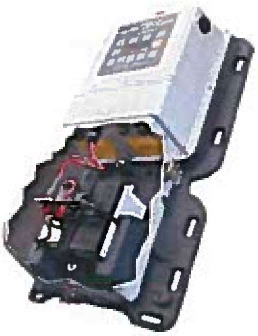
Voltage can be adjusted in 5 volt increments, frequency in 1 Hertz increments, and duty cycle (pulse width) in 1% increments. This is very desirable given study results which indicate that fish injury rates decrease corresponding to decreases in all of these settings. Exact control of the settings allows for much greater control of the output waveforms.

Numerous waveform choices

The LR-24 can produce straight DC, pulsed DC, and Burst of Pulses (previously known as CPS waveform).

Rugged Construction

Roto-molded packframe and molded control box housing offer tough structural support in a light-weight package. The removable battery cover protects all cable connections from environmental conditions and wear and tear.



Storage locations for up to 10 user selected settings

There are 10 storage locations available to either pre-program desirable settings or to store settings currently in use. These storage locations are filled with Factory Default Stored Waveforms, but can be replaced one by one with settings the user prefers. These can be pre-programmed before going in the field or saved and stored while in the field. This can be very useful if a setting has been found to be very effective with a particular species, or it can be of use if a project supervisor wants to standardize sampling and provide settings for crews to use in the field. Factory default stored waveforms can be restored if desired.

Suspension System

The easy-to-fit Cordura suspension harness allows for quick adjustment, making multi-user operations fast, simple and convenient.

SAFETY FIRST

The LR-24 Electrofisher is the first and only electrofisher independently tested and certified to meet published safety standards.

Technical Specifications

Output Power	400W continuous, 39,600W peak
Output Voltage	50 to 990V in 5V steps
Output Frequency	0 to 120Hz in 5Hz steps, Gated burst up to 1000Hz
Duty Cycle	0% to 99% in 1% steps
Output Current	40A peak max, 4A continuous at 100V

Specifications subject to change without notice.

Output Waveforms	Smooth DC, Pulsed DC, Burst of Pulses DC
Waveform Storage	Save voltage, frequency, duty cycle and pulse type for 10 different waveforms
Operational Duty Cycle	40% Max. (192 seconds on 288 seconds off) at 40° C ambient 400VA output
Overload Protection	Excessive peak current, average current or over-temperature will shutdown the unit before damage can occur. Resets automatically when condition is corrected
Output Indicator	Audio tone for 30VDC and greater and increasing pulse rate for output power, Flashing red light, Status display for output voltage both average and peak, output current both average and peak and output power
Metering	Peak and average output current, Peak and average output voltage, Peak and average output power, Battery voltage, Battery current, Battery fuel gauge, Timer, Waveform settings, Error messages, Fault conditions
Output On Timer	0 to 999,999 seconds, resettable via menu
Environmental Requirements	Operational altitude: -400 to 3000 meters Relative humidity: 10% to 90% noncondensing Operating temperature: 0° to 40° C Storage temperature: -15° to 50° C
Construction	Sealed molded polyethylene and ABS case NEMA 4, IP 65
Safety Devices	Output indicator Tilt switch: Forward 50°, backward 40°, sideways 45° all ± 10° Immersion sensor Electrode out of water sensor Electode pole switch Emergency stop switch Battery compartment interlock Battery fuseable link
Electrodes	6 ft. 2-piece pole, 6 ft. 1-piece pole; 6 in., 11 in., 18 in. aluminum ring, 11 in. stainless steel ring; stainless steel trailing cathode
Battery	Choice of 24V batteries
Battery Life	40 minutes continuous at 100W with 7Ah battery

Specifications subject to change without notice.

Size and Weight	Height: 27.5 in (69.9 cm) Width: 14.5 in (36.9 cm) Depth: 14.5 in (36.9 cm) Weight: 20.35 lb. (9.23 kg) without battery or accessories
Certifications	UL STD 61010A-1 CAN/CSA C22.2 STD NO. 1010.1

Specifications subject to change without notice.

Need an electrofisher for only a week or a month? Rent one.

The Smith-Root rental program is a worry-free and flexible way to get the equipment you need for field season. You can rent on a weekly or monthly basis and Smith-Root's rental program also offers you credit toward ownership of new equipment.

Learn more (/services/rentals/)

(/services/rentals/)

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Since 1964, Smith-Root has proudly partnered with fisheries scientists to develop solutions for the fisheries conservation community.

Appendix D:

2019 Stream Bioassessment: Rowlett Creek, City of Garland, Rowlett Creek Headwaters, City of Plano, and Delaware Creek, City of Irving

Job No. ATK18674

2018 - 2019 STREAM BIOASSESSMENT: ROWLETT CREEK, CITY OF GARLAND, ROWLETT CREEK HEADWATERS, CITY OF PLANO, AND DELAWARE CREEK, CITY OF IRVING

Prepared for:

North Central Texas Council of Governments
616 Six Flags Drive
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AUSTIN, TEXAS 78759

February 2020

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ACRONYMS AND ABBREVIATIONS

ALU	Aquatic Life Use
DO	dissolved oxygen
EPA	U.S. Environmental Protection Agency
FNI	Freese and Nichols, Inc.
IBI	Index of Biotic Integrity
mg/L	milligrams per liter
mL	milliliter(s)
NCTCOG	North Central Texas Council of Governments
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks & Wildlife Department
USGS	U.S. Geological Survey

1.0 INTRODUCTION

Atkins, under contract to the North Central Texas Council of Governments (NCTCOG), subcontracted with Freese and Nichols, Inc. (FNI) to conduct stream rapid bioassessments on Rowlett Creek in Garland, Texas, Rowlett Creek Headwaters in Plano, Texas, and Delaware Creek in Irving, Texas, in 2018 and 2019. Each creek was sampled at the same location during the months of June and September in 2018 and in 2019, for a total of four sampling trips per site. Habitat parameters and benthic macroinvertebrate and fish communities were sampled and data compared to metrics from the Texas Commission on Environmental Quality (TCEQ, 2014). The comparisons allowed the calculation of indices of biotic integrity (IBI) for each location and each sample event. Water chemistry and flow parameters were also measured concurrently with each trip.

All streams are located in the Texas Blackland Prairie ecoregion (Ecoregion 32) (Griffith et al., 2004). Within an ecoregion, soils, climate, landform, and vegetation are expected to be relatively similar. Reference conditions for benthic macroinvertebrates and fish inhabiting wadeable streams in the Texas Blackland Prairie ecoregion are described by the TCEQ (2012). Evaluating benthic macroinvertebrates and fish communities with aquatic life use metrics in TCEQ (2014) may indicate whether the streams have been impacted by human activities.

This report summarizes sampling methods, data collected, and final bioassessment results (Table 1). Aquatic life use designations help the TCEQ determine the desired uses and water quality criteria appropriate for streams, and the designations will reflect the impact that impairments such as pollutants, landscape stressors, and habitat alteration can have on stream integrity.

Table 1. Aquatic Life Use Designations for Fish, Benthic Macroinvertebrates, and Habitat in Rowlett, Rowlett Headwaters and Delaware Creeks for 2018-2019

	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek	
2018	**June**	**Sept**	**June**	**Sept**	**June**	**Sept**
Habitat Quality Index	H	H	H	H	H	H
Fish IBI	I	I	I	I	I	L
Benthic Macroinvertebrate IBI	H	H	I	H	H	H
2019						
Habitat Quality Index	H	H	H	H	H	H
Fish IBI	I	I	I	H	L	I
Benthic Macroinvertebrate IBI	I	I	I	I	H	H

ALU abbreviations: L = Limited, I = Intermediate, H = High

2.0 SITE DESCRIPTIONS

Rowlett Creek (GARBA20189) was sampled downstream of State Highway 78 in the city of Garland, Dallas County, Texas (figures 1 and 2). Rowlett Creek extends 25 stream miles upstream of the study reach into the city of McKinney, Collin County, Texas.

Figure 1: Rowlett Creek (GARBA20189) below State Highway 78 on September 19, 2018. View towards upstream. Photograph taken by Tam Tran (FNI)

Pittman and Spring creeks in Plano, Cottonwood Creek in Allen, and Russell and West Rowlett creeks in Frisco form the 77,000-acre Rowlett Creek watershed upstream of the Garland study reach. Treated wastewater from the North Texas Municipal Water District's Rowlett Creek Wastewater Treatment Plant (Texas Pollutant Discharge Elimination System water quality permit number WQ0010363001) is the only permitted wastewater discharge in the watershed. This discharge enters Rowlett Creek about 8.2 miles upstream of the study reach. The wastewater permit for this facility allows a daily average discharge of 24 million gallons per day. There are no dams on Rowlett Creek upstream of the study reach.

Except for riparian zones along creeks and parks, the watershed is rapidly developing with more than half the watershed covered with residential and commercial development. The 1,640-foot-long study reach

FNI PROJECT NUMBER	ATK18109
DATE CREATED	Date: 2/1/2019
DATUM & COORDINATE SYSTEM	NAD83 State Plane (Feet) Texas Central
FILE NAME	Name: Figure_1
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North Central Texas Council of Governments
2018-2021 Bioassessments

ROWLETT CREEK (GARBA20189) DOWNSTREAM OF ATSF RAILROAD IN GARLAND

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FIGURE 2

captures drainage from most of the Rowlett Creek watershed upstream of Garland. The upstream end of the study reach starts at the downstream edge of the Kansas Southern Railroad bridge, about 180 feet downstream of the confluence with Spring Creek. The study reach extends under the State Highway 78 bridge, then under the Ben Davis Road bridge, which is closed to traffic, under two electric transmission lines, and ends downstream of a concrete pad extending from the south (right) bank into the creek. Much of the riparian zone along this reach is forested. Within the study reach the riparian buffer on the north side of Rowlett Creek is over 400 feet wide in places and wooded riparian vegetation extends along about 76% of the shore. Along the south shore, the riparian zone is up to 300 feet wide in places and extends along about 69% of the shore.

Rowlett Creek Headwaters (PLRBA20189) was sampled downstream of Alma Drive in the city of Plano, Collin County, Texas (figures 3 and 4). The creek extends 1.4 stream miles upstream of this point to the confluence of West Rowlett Creek and Rowlett Creek. West Rowlett Creek extends an additional 6.8 miles upstream, and Rowlett Creek extends an additional 7 miles upstream. No dams impound either creek upstream of the study reach.

Figure 3: Rowlett Creek Headwaters (PLRBA20189) downstream of Alma Drive on June 19, 2018. View towards downstream. Photograph taken by Tam Tran (FNI).

At the upstream end of the watershed, the creek maintains a natural streambed and traverses through primarily residential areas and golf courses. Rowlett Creek's watershed upstream of the study reach covers approximately 17,700 acres. There are no permitted wastewater discharges upstream of the study reach. The 1,200-foot-long study reach along the creek is buffered on the left and right banks by Suncreek Park. Most of the park is a mowed and maintained grassy area with paved walking paths. The riparian zone is relatively wide, with a minimum buffer of 40 feet, and a maximum buffer of 425 feet within the study reach.

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DATE CREATED
Date: 2/1/2019

DATUM & COORDINATE SYSTEM
NAD83 State Plane (Feet) Texas Central

FILE NAME
Name: Figure_1

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ROWLETT CREEK AT HEADWATERS (PLRBA20189) IN PLANO

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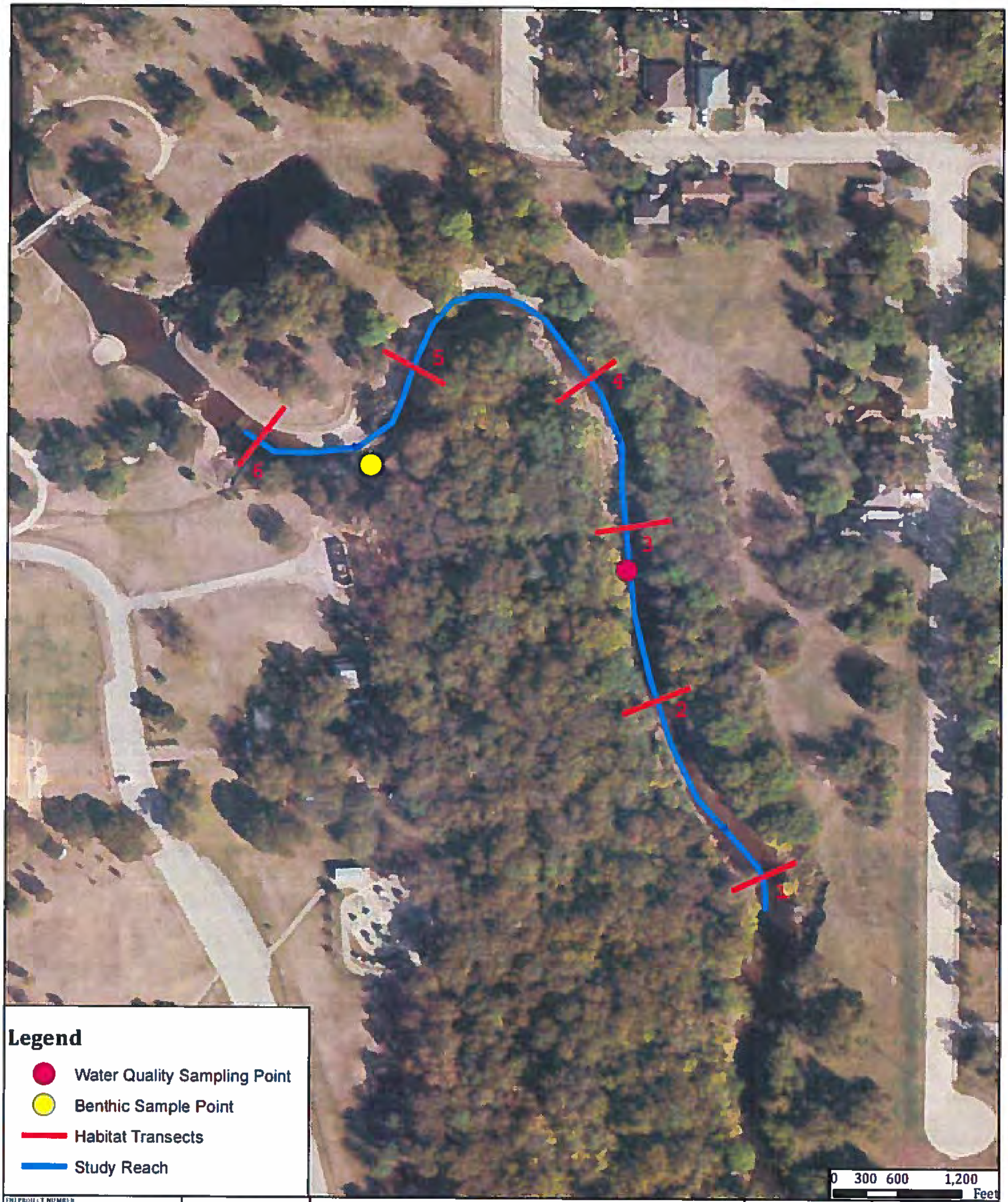
FIGURE 4

Delaware Creek (IRRBA20189) was sampled downstream of a weir dam in Fritz Park in the city of Irving, Dallas County, Texas (figures 5 and 6). The creek extends 5.2 stream miles upstream of the study reach to north Irving, just south of the West Airport Freeway (State Highway 183). At the upstream end of the watershed, the creek is confined to a concrete channel for over two miles and passes through several parks as well as residential and commercial areas.

Figure 5: Delaware Creek (IRRBA20189) downstream of Fritz Park on September 20, 2018. View towards downstream. Photo taken by Tam Tran (FNI)

The Delaware Creek watershed upstream of the study reach covers approximately 4,750 acres. Delaware Creek is a highly altered watercourse with two low water dams located upstream of the study reach that form extensive impoundments. The creek is substantially modified beginning 0.5 stream mile upstream of the study reach. The creek is embedded in a trapezoidal concrete channel for over 2 stream miles and impounded in on-channel reservoirs in several areas. Along the 1,250-foot-long study reach there is a limited riparian buffer along the east (left) shore and an extensive riparian buffer along most of the west (right) shore with a maximum buffer of over 300 feet. Residential areas and maintained park land are extensive near the study reach and surround the study reach beyond the adjacent riparian buffers.



FNI PROJECT NUMBER
ATK18309

DATE CREATED
Date 2/1/2019

DATUM & COORDINATE SYSTEM
NAD83 State Plane (Feet) Texas Central

FILE NAME
Name: Figure_5

PREPARED BY
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2018-2021 Bioassessments

DELAWARE CREEK (IRRBA20189) IN FRITZ PARK IN IRVING

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FIGURE 6

3.0 METHODS

Methods described here were used for each sample event at each study reach. Rowlett Creek, Rowlett Creek Headwaters, and Delaware Creek were sampled during the "Non-critical" period between June 18 and 20 in 2018, and between June 12 and 14 in 2019. The streams were sampled during the "Critical" period between September 18 and 20 in 2018, and September 17 and 19 in 2019. The TCEQ (2012) recommends one sample be collected during the Non-critical period and one during the Critical Period when two samples are collected at the same site during the same year. The TCEQ (2012) also recommends samples be collected at least 1 month apart, when flows are relatively low, and not recently impacted by rainfall runoff. In order to determine if flow conditions were suitable for sampling, flows at the U.S. Geological Survey (USGS) gauges on Rowlett Creek (Station 08061640) and Bear Creek (Station 0804956950) were observed for 2 weeks prior to each sample event. The Rowlett Creek gage was selected, because it is at the upstream end of the Rowlett Creek study reach and downstream of the Rowlett Creek Headwaters study reach. The Bear Creek gage was selected because it is the closest relevant location to Delaware Creek and is also on a tributary to the West Fork Trinity River. Sampling methods followed the TCEQ's surface water quality monitoring procedures (TCEQ, 2012, 2014) and were also described in the "Regional Stormwater Monitoring Plan: Bioassessment Monitoring Plan 2018–2021" (FNI, 2018).

The Non-critical period (March 15–June 30 and October 1-15) represents the relatively warm period of the year when reproduction, growth, and migration of fish and other aquatic organisms typically occurs. The Critical Period (July–September) usually experiences lowest flows, highest water temperatures, and extended hours of sunlight. These conditions may contribute to dissolved oxygen levels that become critically low for aquatic life. Water's ability to contain dissolved oxygen decreases as temperature increases. If aquatic plants are abundant in the summer, dissolved oxygen can decline to harmful levels for fish in the early morning. These early morning declines in oxygen result from lack of photosynthetic oxygen production during the night combined with relatively high rates of oxygen consumption by aquatic plants and animals in the warm stream.

FNI fisheries biologist, Aaron Petty and biologist Tam Tran, conducted all of the sample events at each stream. NCTCOG staff assisted with sampling events in Garland and Plano on June 18 and 19, 2018, in Irving on September 20, 2018, and in Irving on June 12, 2019. Heather Firn, City of Plano, and staff assisted with all four sample events at the Rowlett Creek Headwaters study reach in Plano in 2018 and 2019.

3.1 HABITAT

Study reaches for each stream were calculated based on the average width measurements taken during initial site reconnaissance. Forty times the average wetted width of each stream (in meters) determined the length of stream reach evaluated up to a maximum length of 1,640 feet. Habitat was assessed at six transects that were evenly spaced along each stream reach during the June sample event. Photographs were taken of the upstream and downstream reaches and of each bank at each transect. During the September sample event, a tape measure was used to measure stream widths at each transect and photographs were taken. Habitat characteristics measured during the June sample event were reviewed in September, and the sample crew determined the habitat in September was similar to the June habitat measurements in all streams in both years. Stream flow was measured using a Sontek Flowtracker®. Study reaches included riffles, pools, glides, and runs.

3.2 WATER QUALITY

Grab samples for laboratory analysis of water quality were taken in representative portions of each creek at a depth of 1 foot, immediately preserved on ice, and delivered to the laboratory within 3 hours of collection. Water samples were analyzed by TTI Environmental Laboratories in Arlington for *E. coli* bacteria, nitrate-nitrogen, and dissolved phosphate-phosphorus. The Critical Period water samples taken in September were delivered to TTI in Arlington and the analysis was performed by their certified subcontracted laboratories.

A HydroTech OEM Hydrolab® Compact DS water quality meter measured dissolved oxygen (DO), specific conductance, temperature, and pH when water samples were collected for laboratory analysis at the water quality sampling point. A YSI 6920 V2 equipped with an optical dissolved oxygen probe and a turbidity probe measured DO, turbidity, specific conductance, temperature, and pH every 15 minutes over a diurnal period during each sample event.

3.3 FISH

Fish were collected along the length of the study reach using two methods:

- Electrofishing with a variable-voltage Smith-Root Model 15-C generator-powered backpack unit fished for at least 15 minutes. One person operated the backpack unit, and one to three people collected fish with long-handled dip nets.

- Seining with a 10-x-6-foot x ⅛-inch mesh seine and a 30-x-6-foot x ¼-inch mesh seine for a minimum of six seine hauls.

All wadeable habitat types were sampled. Pools over 4 feet deep were not sampled due to the inability of seines and the backpack shocker to effectively and safely sample this habitat. Fish were identified to species, counted, and observed for external deformities. Two individuals of each species from each creek were preserved in 10% buffered formalin and will be maintained as voucher specimens. Voucher photographs were collected of fish longer than 10 inches total length if necessary.

3.4 BENTHIC MACROINVERTEBRATES

Benthic macroinvertebrates were collected with 5-minute kick-net samples in riffles with a triangle frame dip net equipped with 0.5-millimeter mesh. Snag sampling techniques were also employed to account for deeper areas and streams with unstable substrate and included the collection of macroinvertebrates from submerged woody debris and boulders. Samples were collected in riffles consisting of a variety of cobblestones, boulders, concrete riprap, coarse sand, and bedrock. The same riffles were sampled in all sample events. Organisms were preserved in the field with 95% ethanol and sent to Jack Davis for analysis. After analysis, organisms identified and counted for the benthic macroinvertebrate assessments were preserved as voucher samples. For the September 2018 and 2019 benthic sample at Rowlett Creek Headwaters, an additional sample site was utilized due to scour and loss of riffle substrate from high flow events between sampling dates. The new sample site is at the downstream end of the study reach near habitat transect 1.

3.5 MUSSELS

Mussels were sought by visually scanning the stream bottom and shores. The clear shallow water in the Rowlett Creek Headwaters and Delaware creeks allowed the bottom to be seen throughout nearly the entire study reach. Live and empty mussel shells of Lilliput (*Toxolasma parvum*) and Paper Pondshell (*Utterbackia imbecillis*) were observed in Delaware Creek in 2018 and 2019. Native mussels were not observed in the Rowlett or Rowlett Headwaters reaches. *Corbicula fluminea*, the Asiatic clam, was observed in all three creeks.

4.0 RESULTS AND DISCUSSION

4.1 HABITAT

Habitat quality index scores are but one measure of stream composition, and they reflect the impact that impairments such as pollutant discharge, landscape stressors, and riparian zone alterations can have on stream integrity. Although the relationship between human activity from induced chemical contamination, flow modification, or habitat alteration to stream health is complex, the resulting impairments can be quantified through index scores. To detect impacts possibly caused by those stressors, it is important to understand how physical habitat quality may affect biological communities.

Tables 2 and 3 summarize habitat quality assessments for Rowlett, Rowlett Headwaters and Delaware creeks in the Critical and Non-critical periods for 2018 and 2019. The directional arrows next to the scores in tables 4 and 5 show changes in the habitat quality index scores and associated metrics between 2018 and 2019. Tables 4 and 5 list data used to derive the assessments from 2018 and 2019, respectively. Rowlett Creek had a habitat quality index score of 22 in both 2018 and 2019, placing it in the high habitat quality category for both years. Rowlett Creek Headwaters had a habitat quality index score of 24 in 2018 and 23 in 2019, also remaining in the high habitat quality category. The decrease in score by 1-point was reflective of a lower bottom substrate stability score, which correlates to a lower percentage of gravel-sized or larger substrate. The explanation for the change is likely due to the redistribution of in-channel depositional gravel bars during large flows between the 2018 and 2019 sample events. Delaware Creek had a habitat quality index score of 21 in 2018 and 20 in 2019, keeping the stream in the high habitat quality category. The drop in score by 1-point was reflective of a lower percentage of in-stream cover, due to lower amounts of aquatic macrophytes and algae in 2019.

High habitat quality index scores range from 20–25. Rowlett Creek had the highest possible scores for pool size, water level, riparian buffer, and channel sinuosity. Rowlett Creek Headwaters retained the highest possible scores for bottom-substrate stability, pool size, water level, channel sinuosity, and riparian buffer. Delaware Creek had a large amount of concrete rubble/riprap and stable limestone bedrock forming much of the bottom in the study reach. These materials provide high substrate stability but do not provide optimal habitat. Delaware Creek retained the highest possible score for substrate stability, pool size, and riparian buffer between 2018 and 2019. Neither creek received the lowest possible score in any category.

All study reaches exhibited effects of high flow that had moved cobble and boulders in riffles and additional erosion between the 2018 and 2019 sample events. The habitat characteristics did not substantially change between years, but minor change in scores for Rowlett Creek Headwaters and Delaware Creek were observed. Rowlett Creek flow was relatively similar between events, reflecting the stabilizing influence of the wastewater treatment plant discharge on flow, which contributes approximately 37 cfs of continuous base flow. Rowlett Creek Headwaters exhibited lower flows in both 2019 samples events than in 2018, with flows of 5.5 cfs for both June and September events. Delaware Creek maintained low flows throughout the study during sample events, however the June 2019 sample event had a slightly higher flow of 0.6 cfs, compared with the previous flow range of 0.1 to 0.2 cfs. The impoundments upstream of the study area on Delaware Creek continued to buffer higher continuous flows.

For both 2018 and 2019, habitat characteristics measured during the June sample event in Rowlett, Rowlett Creek Headwaters and Delaware creeks were reviewed in September, and the sample crew determined habitats in September were similar to the June habitat measurements in all streams.

Table 2. Habitat Quality Index Scores for Rowlett, Rowlett Headwaters, and Delaware Creeks on June 18–20, 2018

	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		
Habitat Quality Index	Measurement Category	Habitat Quality Index Score	Measurement Category	Habitat Quality Index Score	Measurement Category	Habitat Quality Index Score	Maximum Possible Habitat Quality Index Score*
Available Instream Cover	Rare	2	Rare	2	Common	3	4
Bottom Substrate Stability	Moderately Unstable	2	Stable	4	Stable	4	4
Number of Riffles	Common	3	Common	3	Rare	2	4
Dimensions of Largest Pool	Large	4	Large	4	Large	4	4
Water Level	High	3	High	3	Low	1	3
Bank Stability	Moderately Unstable	1	Moderately Unstable	1	Moderately Unstable	1	3
Channel Sinuosity	High	3	High	3	Moderate	2	3
Riparian Buffer Vegetation	Extensive	3	Extensive	3	Extensive	3	3
Aesthetics of Reach	Common Setting	1	Common Setting	1	Common Setting	1	3
Total Score		**22**		**24**		**21**	**31**
Habitat Quality		*High*		*High*		*High*	*Exceptional*

*Habitat quality index scores may range from 26–31 exceptional, 20–25 high, 14–19 intermediate, and ≤13 limited.

Table 3. Habitat Quality Index Scores for Rowlett, Rowlett Headwaters, and Delaware Creeks on June 12–14, 2019

	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		
Habitat Quality Index	Measurement Category	Habitat Quality Index Score	Measurement Category	Habitat Quality Index Score	Measurement Category	Habitat Quality Index Score	Maximum Possible Habitat Quality Index Score*
Available Instream Cover	Rare	2	Rare	2	Rare	2↓	4
Bottom Substrate Stability	Moderately Unstable	2	Moderately Stable	3↓	Stable	4	4
Number of Riffles	Common	3	Common	3	Rare	2	4
Dimensions of Largest Pool	Large	4	Large	4	Large	4	4
Water Level	High	3	High	3	Moderate	↑2	3
Bank Stability	Moderately Unstable	1	Moderately Unstable	1	Moderately Unstable	1	3
Channel Sinuosity	High	3	High	3	Moderate	2	3
Riparian Buffer Vegetation	Extensive	3	Extensive	3	Extensive	3	3
Aesthetics of Reach	Common Setting	1	Common Setting	1	Common Setting	1	3
Total Score		**22**		**↓23**		**21**	**31**
Habitat Quality		*High*		*High*		*High*	*Exceptional*

*Habitat quality index scores may range from 26–31 exceptional, 20–25 high, 14–19 intermediate, and ≤13 limited.

Table 4. Stream Characteristics for Rowlett, Rowlett Headwaters, and Delaware Creeks on June 18–20, 2018, and the Habitat Quality Indices They Support

Habitat Characteristic	Rowlett Creek	Rowlett Creek Headwaters	Delaware Creek	Habitat Quality Index Category
Dominant substrate	Silt, gravel, clay, boulders	Gravel, cobble, claypan, bedrock	Riprap, cobble, gravel, bedrock	Available instream cover
Gravel-sized substrate or larger, average %	22%	60%	69%	Bottom substrate stability
Instream cover, average	24%	23%	33%	Available instream cover
Types of instream cover	Cobble, riprap, woody debris, undercut banks	Cobble, undercut banks, roots, woody debris, macrophytes	Concrete riprap, woody debris, macrophytes, undercut banks	Available instream cover
Streambank erosion potential, average percent of streambank	60%	43%	36%	Bank stability
Streambank slope, average degrees	53°	38°	42°	Bank stability
Natural buffer vegetation width, average feet	240 ft	160 ft	118 ft	Riparian buffer vegetation
Riparian trees and shrubs, average % cover	73%	85%	53%	Riparian buffer vegetation
Tree canopy coverage, average %	56%	85%	48%	Riparian buffer vegetation
Maximum pool depth (ft)	10.5	4.0	6.2	Dimensions of largest pool
Maximum pool width (ft)	88	33	50	Dimensions of largest pool
Number of riffles	2	2	1	Number of riffles
% of channel bottom covered with water	95%	95%	70%	Channel Flow Status
Number of well-defined bends	2	2	1	Channel sinuosity
Number of moderately-defined bends	1	1	0	Channel sinuosity
Number of poorly-defined bends	0	1	1	Channel sinuosity
Flow (cubic feet per second) in Non-critical Period	58	10	0.1	Channel Flow Status
Flow (cubic feet per second) in Critical Period	66	17	0.2	Channel Flow Status
Aesthetics of stream reach	Altered landscape w/ few buildings, native veg.	Urban park setting, few buildings, native veg.	Urban park setting, few buildings, native veg.	Aesthetics of reach

Table 5. Stream Characteristics for Rowlett, Rowlett Headwaters, and Delaware Creeks on June 12–14, 2019, and the Habitat Quality Indices They Support

Habitat Characteristic	Rowlett Creek	Rowlett Creek Headwaters	Delaware Creek	Habitat Quality Index Category
Dominant substrate	Silt, gravel, clay, boulders	Gravel, cobble, claypan, bedrock	Riprap, cobble, gravel, bedrock	Available instream cover
Gravel-sized substrate or larger, average %	↑33%	↓48%	↑70%	Bottom substrate stability
Instream cover, average	↓15%	↓13%	↓20%	Available instream cover
Types of instream cover	Cobble, riprap, woody debris, undercut banks	Cobble, undercut banks, roots, woody debris, macrophytes	Concrete riprap, woody debris, macrophytes, undercut banks	Available instream cover
Streambank erosion potential, average percent of streambank	↓56%	↓39%	↑37%	Bank stability
Streambank slope, average degrees	↑55°	↑44°	↑46°	Bank stability
Natural buffer vegetation width, average feet	240 ft	160 ft	118 ft	Riparian buffer vegetation
Riparian trees and shrubs, average % cover	73%	85%	53%	Riparian buffer vegetation
Tree canopy coverage, average %	↑59%	↑93%	↓47%	Riparian buffer vegetation
Maximum pool depth (ft)	↓9.5	↑4.9	↓5.1	Dimensions of largest pool
Maximum pool width (ft)	↑95	↑34	↑53	Dimensions of largest pool
Number of riffles	2	2	1	Number of riffles
% of channel bottom covered with water	95%	95%	↑80%	Channel Flow Status
Number of well-defined bends	2	2	1	Channel sinuosity
Number of moderately-defined bends	1	1	0	Channel sinuosity
Number of poorly-defined bends	0	1	1	Channel sinuosity
Flow (cubic feet per second) in Non-critical Period	↑85	↓5.5	↑0.6	Channel Flow Status
Flow (cubic feet per second) in Critical Period	↓50.5	↓5.5	↓0.1	Channel Flow Status
Aesthetics of stream reach	Altered landscape w/ few buildings, native veg.	Urban park setting, few buildings, native veg.	Urban park setting, few buildings, native veg.	Aesthetics of reach

4.2 WATER QUALITY

Tables 6 and 7 summarize water quality in Rowlett, Rowlett Headwaters and Delaware creeks for the Critical and Non-critical period sample events in 2018 and 2019, respectively. DO, pH, specific conductance, and temperature were within ranges expected to support ecologically healthy streams (TCEQ, 2016). *E. coli* levels exceeded TCEQ's screening level in June 2019 for all three streams, but values were below the 399 colonies/mL screening level during the September sampling events. Dissolved phosphorus levels for all streams during both sampling events in 2019 were below screening levels for unclassified freshwater. Additionally, nitrate levels exceeded TCEQ screening levels in Rowlett Creek during both 2019 sampling events.

Turbidity values are not reported in Table 7 for 5 out of 6 sampling events in 2019 due to water quality meter probe malfunction, however Secchi disk water clarity measurements were 2.2 feet in June and 2.6 feet in September 2019 for Rowlett Creek in Garland. In Plano, Secchi disk water clarity was greater than the deepest pool and greater than 4 feet for both sampling trips in 2019. At Delaware Creek in Irving, Secchi disk measurements were 4.5 feet in June and 5.8 feet in September 2019.

Table 6. Water Quality in Rowlett, Rowlett Headwaters, and Delaware Creeks during June and September 2018 Sample Events

Parameter	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Water Quality Criteria (TCEQ, 2018)
	June	Sept.	June	Sept.	June	Sept.	
Field Measurements							
Number of measurements in 24-hour sample	100	82	98	83	89	94	
Dissolved oxygen, (mg/L), 24-hour average (range)	6.9 (6.2–8.1)	6.9 (6.8–7.3)	7.4 (6.7–8.6)	7.5 (7.3–7.8)	6.9 (5.2–8.6)	6.0 (3.5–7.5)	4.0 mg/L (24-hour average for Rowlett Creek), 5.0 mg/L (24-hour average for Delaware Creek)
Dissolved oxygen, % saturation, 24-hour average (range)	88 (77–105)	88 (85–93)	93 (83–111)	93 (91-100)	88 (66–111)	79 (47–98)	
pH (standard units), 24-hour average (range)	7.7 (7.6–7.9)	7.8 (7.7–7.9)	7.7 (7.4–7.8)	8.0 (8.0–8.0)	7.9 (7.0–8.2)	8.2 (7.9–8.6)	
Specific conductance (µS/cm), 24-hour average (range)	985 (957–1,008)	971 (930–994)	762 (738–785)	893 (864–914)	396 (392–398)	296 (287–318)	
Temperature (°F), 24-hour average (range)	81.4 (79.5–83.6)	81.1 (80.4–82.2)	81.0 (79.1–83.4)	79.7 (78.8–82.1)	81.8 (80.4–84.0)	84.5 (82.9–85.8)	
Turbidity (Nephelometric turbidity units), 24-hour average (range)	13 (6–26)	18 (12–34)	4 (3–13)	5 (4–16)	2 (1–9)	2 (0.1–8)	

Parameter	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Water Quality Criteria (TCEQ, 2018)
	June	Sept.	June	Sept.	June	Sept.	
Lab Measurements							
Escherischia coli bacteria (colonies/ 100 mL)	200	<10	500*	<10	<100	<10	399 colonies/100 mL for a single sample
Phosphorus as Orthophosphate (mg/L)	0.85*	0.035	0.15	0.035	0.23	0.035	0.37 mg/L (screening level)
Nitrogen as Nitrate (mg/L)	1.50	5.73*	0.40	1.28	2.32*	0.14	1.95 mg/L (screening level)

mL = milliliter(s); mg/L = milligrams per liter
*Exceeded TCEQ screening level values (TCEQ, 2016)

Table 7. Water Quality in Rowlett, Rowlett Headwaters, and Delaware Creeks during June and September 2019 Sample Events

Parameter	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Water Quality Criteria (TCEQ, 2018)
	June	Sept.	June	Sept.	June	Sept.	
Field Measurements							
Number of measurements in 24-hour sample	83	94	83	85	90	88	
Dissolved oxygen, (mg/L), 24-hour average (range)	7.3 (6.9–8.4)	6.7 (6.1–7.6)	8.1 (7.9–8.7)	6.7 (6.3–7.9)	5.3 (3.8–7.0)	7.0 (5.7–9.1)	4.0 mg/L (24-hour average for Rowlett Creek), 5.0 mg/L (24-hour average for Delaware Creek)
Dissolved oxygen, % saturation, 24-hour average (range)	87 (81–101)	85 (76–97)	93 (89–105)	83 (77-100)	65 (46–87)	91 (73–119)	

Parameter	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Water Quality Criteria (TCEQ, 2018)
	June	Sept.	June	Sept.	June	Sept.	
pH (standard units), 24-hour average (range)	7.8 (7.6–7.8)	7.6 (7.5–7.7)	7.9 (7.9–8.0)	7.8 (7.6–7.8)	7.8 (7.7–7.9)	7.8 (7.4–8.1)	
Specific conductance (µS/cm), 24-hour average (range)	756 (738–771)	865 (839–888)	673 (655–686)	708 (702–710)	607 (585–629)	583 (575–590)	
Temperature (°F), 24-hour average (range)	75.4 (74.2–77.2)	81.2 (79.6–82.7)	71.9 (70.1–76.4)	79.2 (78.2–81.6)	77.4 (75.6–79.6)	84.1 (82.5–86.3)	
Turbidity (Nephelometric turbidity units), 24-hour average (range)	--[a]	7 (3–24)	--[a]	--[a]	--[a]	--[a]	
Lab Measurements							
Escherischia coli bacteria (colonies/ 100 mL)	820*	260	1,440*	73	450*	155	399 colonies/100 mL for a single sample
Phosphorus as Orthophosphate (mg/L)	0.28	0.34	0.03	<0.04	0.09	<0.04	0.37 mg/L (screening level)
Nitrogen as Nitrate (mg/L)	5.2*	8.0*	1.01	0.51	0.04	<0.05	1.95 mg/L (screening level)

mL = milliliter(s); mg/L = milligrams per liter

* Exceeded TCEQ screening level values (TCEQ, 2016)

[a] Turbidity probe malfunction, erroneous values not reported

4.3 FISH

Tables 8 and 9 summarize fish data collected from Rowlett, Rowlett Headwaters and Delaware creeks during the Critical and Non-critical periods for 2018 and 2019. Tables 10 and 11 summarize scores for fish IBI metrics from all creeks in 2018 and 2019. Directional arrows included with values in tables 9 and 11 illustrate the change in numbers of fish and taxa, and IBI scores between 2018 and 2019 events.

Eight species of fish were collected from Rowlett Creek in June 2019, and 13 species were collected in September 2019, with both sampling events maintaining an intermediate ALU rating. More fish were collected in 2019 (473) than 2018 (284).

The Rowlett Creek Headwaters fish community experienced a reduction in numbers of fish in June 2019 compared with June 2018, but September 2019 saw more than a doubling of numbers compared with September 2018, largely due to higher numbers of minnow species. Thirteen species of fish were collected in both June and September 2019. Sampling on both 2018 dates resulted in intermediate ALU ratings for the fish community, however the September 2019 sampling event saw an increase of 9 points, resulting in a high ALU rating. The primary changes in the Rowlett Creek Headwaters fish community that resulted in a high ALU for September 2019 were a lower percentage of non-native species, higher number of fish per sample, no fish with visible anomalies, and a higher percentage of piscivores.

Nine fish species were collected from Delaware Creek in June, and seven were collected in September 2018. A reduction in collected species occurred in 2019, with seven species in June and 6 in September. The trend of reduction of number of species of minnows in the Delaware Creek fish community continued into 2019, with no cyprinids collected during either sampling event. The minnow species previously collected in June 2018, Red Shiner (*Cyprinella lutrensis*) and Central Stoneroller (*Campostoma anomalum*), were not observed. The September 2019 sampling event collected 484 fish, however only 6 taxa were observed, and 271 were the pollution tolerant Western Mosquitofish (*Gambusia affinis*). For 2018, the Non-critical Period ALU rating was intermediate and the Critical Period rating was limited. For 2019, the cumulative ratings were the same, however the Non-critical Period ALU rating was limited, and the Critical Period rating was intermediate.

Table 8. Fish Collected from Rowlett, Rowlett Headwaters and Delaware Creeks in June and September 2018

	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek			
Species[1]	June	Sept.	June	Sept.	June	Sept.	Feeding Habits	Tolerance to Environmental Stress[2]
Bluegill (*Lepomis macrochirus*)	9	4	11	14	2	2	Insects	Tolerant
Longear Sunfish (*Lepomis megalotis*)	14	26	19	68	19	35	Insects	
Green Sunfish (*Lepomis cyanellus*)	9	14	11	5	90	120	Fish	Tolerant
Sunfish, hybrid[3] (*Lepomis*)	0	0	0	0	15	0		
Largemouth Bass (*Micropterus salmoides*)	17	5	7	1	101	10	Fish	
Spotted Sucker (*Minytrema melanops*)	0	0	0	0	0	5	Insects	
Common Carp (*Cyprinus carpio*)	0	0	0	3	0	0	Plants & animals	Tolerant
Red Shiner (*Cyprinella lutrensis*)	46	5	250	13	34	0	Insects	Tolerant
Central Stoneroller (*Campostoma anomalum*)	42	2	100	4	6	0	Algae	
Plains Killifish (*Fundulus zebrinus*)	0	0	0	2	0	0	Insects	Tolerant
Bullhead Minnow (*Pimephales vigilax*)	20	0	18	28	0	0	Insects	

Species[1]	Rowlett Creek June	Rowlett Creek Sept.	Rowlett Creek Headwaters June	Rowlett Creek Headwaters Sept.	Delaware Creek June	Delaware Creek Sept.	Feeding Habits	Tolerance to Environmental Stress[2]
Mimic Shiner (*Notropis volucellus*)	0	4	14	0	0	0	Plants & animals	Intolerant
Western Mosquitofish (*Gambusia affinis*)	11	51	2	0	3	0	Insects	Tolerant
Blackstripe Topminnow (*Fundulus notatus*)	1	4	4	22	5	24	Insects	
Yellow Bullhead (*Ameiurus natalis*)	0	0	5	2	4	5	Plants & animals	
Channel Catfish (*Ictalurus punctatus*)	0	0	0	3	0	0	Plants & animals	Tolerant
Total fish	**169**	**115**	**441**	**165**	**279**	**201**		
Total taxa	9	9	11	12	10	7		

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[1] All species are native except for Common Carp which is non-native.

[2] Blanks indicate species with intermediate tolerance of environmental stress.

[3] *Lepomis* which are not identified to species were not counted as a separate taxon.

Table 9. Fish Collected from Rowlett, Rowlett Headwaters and Delaware Creeks in June and September 2019

Species[1]	Rowlett Creek June	Rowlett Creek Sept.	Rowlett Creek Headwaters June	Rowlett Creek Headwaters Sept.	Delaware Creek June	Delaware Creek Sept.	Feeding Habits	Tolerance to Environmental Stress[2]
Bluegill (*Lepomis macrochirus*)	1	3	13	38	8	16	Insects	Tolerant
Longear Sunfish (*Lepomis megalotis*)	16	33	22	18	38	42	Insects	
Green Sunfish (*Lepomis cyanellus*)	31	47	23	88	82	146	Fish	Tolerant
Largemouth Bass (*Micropterus salmoides*)	35	6	29	2	0	0	Fish	
Common Carp (*Cyprinus carpio*)	0	0	1	3	0	0	Plants & animals	Tolerant
Red Shiner (*Cyprinella lutrensis*)	90	11	24	64	0	0	Insects	Tolerant
Central Stoneroller (*Campostoma anomalum*)	33	20	81	35	0	0	Algae	
Plains Killifish (*Fundulus zebrinus*)	0	0	5	3	0	0	Insects	Tolerant
Bullhead Minnow (*Pimephales vigilax*)	0	4	0	65	0	0	Insects	
Mimic Shiner (*Notropis volucellus*)	0	53	5	0	0	0	Plants & animals	Intolerant
Western Mosquitofish (*Gambusia affinis*)	2	54	1	18	5	271	Insects	Tolerant

Species[1]	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Feeding Habits	Tolerance to Environmental Stress[2]
	June	Sept.	June	Sept.	June	Sept.		
Blackstripe Topminnow (*Fundulus notatus*)	0	29	1	55	5	3	Insects	
Yellow Bullhead (*Ameiurus natalis*)	0	2	4	7	2	6	Plants & animals	
Channel Catfish (*Ictalurus punctatus*)	0	1	9	3	0	0	Plants & animals	Tolerant
Flathead Catfish (*Pylodictis olivaris*)	1	1	0	0	0	0	Fish	
Spotted Gar (*Lepisosteus oculatus*)	0	0	0	0	1	0	Fish	Tolerant
Total fish	**↑209**	**↑264**	**↓218**	**↑399**	**↓141**	**↑484**		
Total taxa	↓8	↑13	↑13	↑13	↓7	↓6		

[1] All species are native except for Common Carp which is non-native.

[2] Blanks indicate species with intermediate tolerance of environmental stress.

[3] *Lepomis* which are not identified to species were not counted as a separate taxon.

Table 10. Fish Index of Biotic Integrity Metric Scores for Rowlett, Rowlett Headwaters and Delaware Creeks, June and September 2018

	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Maximum Possible Score*
Metric	June	September	June	September	June	September	
Total number of species	3	3	5	5	5	3	5
Number of native minnow species	3	3	5	3	3	1	5
Number of bottom dwelling fish that eat insects	1	1	1	1	1	1	5
Number of sunfish species	3	3	3	3	3	3	5
% of individuals that tolerate environmental stress	3	1	1	3	3	1	5
% of individuals that eat animals and plants	5	5	5	5	5	5	5
% of individuals that eat insects	3	5	5	5	1	1	5
% of individuals that eat fish	5	5	1	1	5	5	5
Number of individuals per sample	2	2	3	3	3	3	5
% of individuals that are non-native species	5	5	5	3	5	5	5
% of individuals with disease or physical anomalies	5	3	5	3	5	5	5
Total score	**38**	**36**	**39**	**35**	**39**	**33**	**55**
Aquatic life use category	*Intermediate*	*Intermediate*	*Intermediate*	*Intermediate*	*Intermediate*	*Limited*	*Exceptional*

*Fish index of biotic integrity scores for the Texas Blackland Prairie ecoregion (Ecoregion 32) range from ≥49 exceptional, 41–48 high, 35–40 intermediate, and <35 limited.

Table 11. Fish Index of Biotic Integrity Metric Scores for Rowlett, Rowlett Headwaters and Delaware Creeks, May and September 2019

Metric	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Maximum Possible Score*
	June	September	June	September	June	September	
Total number of species	3	↑5	5	5	↓3	3	5
Number of native minnow species	3	↑5	↓3	3	↓1	1	5
Number of bottom dwelling fish that eat insects	1	1	1	1	1	1	5
Number of sunfish species	3	3	3	3	3	3	5
% of individuals that tolerate environmental stress	3	1	↑3	3	↓1	1	5
% of individuals that eat animals and plants	5	↓1	5	5	5	5	5
% of individuals that eat insects	3	↓3	↓1	5	↑3	↑5	5
% of individuals that eat fish	5	5	↑5	↑5	5	5	5
Number of individuals per sample	2	↑3	↓2	↑4	↓2	↑4	5
% of individuals that are non-native species	5	5	5	↑5	5	5	5
% of individuals with disease or physical anomalies	5	↑5	5	↑5	5	5	5
Total score	**38**	**↑37**	**↓38**	**↑44**	**↓34**	**↑38**	**55**
Aquatic life use category	*Intermediate*	*Intermediate*	*Intermediate*	*↑High*	*↓Limited*	*↑Intermediate*	*Exceptional*

*Fish index of biotic integrity scores for the Texas Blackland Prairie ecoregion (Ecoregion 32) range from ≥49 exceptional, 41–48 high, 35–40 intermediate, and <35 limited.

4.4 BENTHIC MACROINVERTEBRATES

Tables 12 and 13 summarize benthic macroinvertebrate data collected for Rowlett, Rowlett Headwaters and Delaware creeks during the Critical and Non-critical periods for 2018 and 2019. Tables 14 and 15 summarize the scores for benthic macroinvertebrate index of biotic integrity metrics from all creeks in 2018 and 2019. Directional arrows included with values in tables 13 and 15 illustrate the change in numbers of benthic macroinvertebrates and taxa, and index of biotic integrity scores between 2018 and 2019 events.

Twenty benthic macroinvertebrate taxa were collected in Rowlett Creek, with 19 collected in June compared to 12 collected in September 2018. In total, 16 taxa were collected in 2019, with 12 in June and 13 in September. Both sample events in 2019 scored intermediate ALU ratings, a reduction from the high ALU results in 2018. The primary metrics which led to lower scores included the absence of riffle beetle larvae, a higher proportion of organisms belonging to the numerically dominant taxon and functional feeding group, and low numbers of non-insect taxa.

Twenty-four benthic macroinvertebrate taxa were collected in Rowlett Creek Headwaters, with 17 collected in June compared to 16 collected in September 2018. Eleven taxa were collected in June 2019 and twelve were collected in September 2019. The 2018 sample events split intermediate and high ALU ratings, however the ALU ratings for both 2019 events were intermediate. Reasons for the drop in scores included lower taxa richness, a higher percentage of midge fly larvae, a higher proportion of organisms belonging to the numerically dominant taxon and functional feeding group, and low numbers of non-insect taxa.

Twenty-six benthic macroinvertebrate taxa were collected in Delaware Creek, with 22 collected in June compared to 13 collected in September 2018. Seventeen taxa were collected in June and fifteen were collected in September 2019. All sample events scored high ALU ratings (Tables 14 and 15). Although Delaware Creek is the smallest drainage of the streams in the study, the high ALU scores are a credit to not only the water quality, but the abundance of benthic macroinvertebrate habitat in the form of concrete rubble.

Table 12. Benthic Macroinvertebrates Collected from Rowlett, Rowlett Headwaters and Delaware Creeks in June and September 2018

Species	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Feeding Habits	Tolerance Value*
	June	Sept.	June	Sept.	June	Sept.		
Leeches (Hirudinea)	0	0	0	1	62	6	Predator	8
Caddisfly (*Cheumatopsyche*)	52	23	68	19	2	31	Filtering collector	6
Caddisfly (*Chimarra*)	7	35	109	61	2	63	Filtering collector	2
Caddisfly (*Hydropsyche*)	3	1	0	0	0	0	Filtering collector	5
Crayfish (Cambaridae)	0	0	0	0	1	0	Collector-gatherer	5
Drain fly larvae (*Psychoda*)	0	0	1	0	0	0	Collector-gatherer	10
Scuds (*Hyallela*)	5	0	17	1	163	8	Collector-gatherer/ shredder	8
Seed shrimp (Ostracoda)	0	0	0	0	2	0	Collector-gatherer	
Snails (*Physella*)	0	0	0	1	5	1	Scraper	9
Horn snails (*Gyraulus*)	0	0	0	0	1	0	Scraper	8
Horn snails (*Helisoma*)	0	0	0	0	8	0	Scraper	7
Worms (Oligochaeta)	8	2	0	0	6	2	Collector-gatherer	8
Beetle larvae (Carabidae)	0	0	0	1	0	0		
Rove beetle larvae (Staphylinidae)	0	0	3	0	0	0	Predator	
Scavenger beetle larvae (*Berosus*)	0	0	0	0	3	0	Collector-gatherer/predator	9
Scavenger beetle larvae (*Paracymus*)	0	0	0	0	2	0	Predator	
Scavenger beetle larvae (*Tropisternus*)	0	0	0	0	4	0	Predator	10
Snout moth larvae (Pyralidae)	0	0	0	1	0	0		
Snout moth larvae (*Petrophila*)	3	0	0	0	1	0	Scraper	5
Damselfly larvae (*Argia*)	8	3	3	8	7	0	Predator	6
Damselfly larvae (*Enallagma*)	0	0	1	0	0	0	Predator	6

Species	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Feeding Habits	Tolerance Value*
	June	Sept.	June	Sept.	June	Sept.		
Damselfly larvae (*Hetaerina*)	4	0	2	0	0	0	Predator	6
Damselfly larvae (*Ischnura*)	0	0	0	0	1	0	Predator	9
Dragonfly larvae (*Brechmorhaga*)	0	1	1	0	0	0	Predator	6
Dragonfly larvae (*Epitheca*)	0	0	0	0	1	0	Predator	4
Flatworm (*Dugesia*)	3	0	1	0	0	0	Predator	7.5
Water strider larvae (*Microvelia*)	0	0	0	0	1	0	Predator	
Water strider larvae (*Rhagovelia*)	0	0	0	7	0	0	Predator	
Midge fly larvae (Chironomidae)	12	16	18	7	4	45	Predator/collector-gatherer/filtering collector	6
Midge fly larvae (*Probezzia*)	0	0	0	0	0	3	Predator	
Riffle beetle (*Heterelmis*)	1	0	0	0	0	0	Scraper/collector-gatherer	4
Riffle beetle (*Stenelmis*)	1	1	1	0	1	5	Scraper/collector-gatherer	7
Black fly larvae (*Simulium*)	0	0	4	0	0	0	Filtering collector	4
Mayfly larvae (*Baetis*)	7	0	0	0	0	0	Scraper/collector-gatherer	4
Mayfly larvae (*Caenis*)	3	0	1	6	27	1	Scraper/collector-gatherer	7
Mayfly larvae (*Callibaetis*)	0	0	0	0	2	0	Collector-gatherer	4
Mayfly larvae (*Camelobaetidius*)	2	21	2	1	0	0	Scraper/collector-gatherer	4
Mayfly larvae (*Fallceon*)	25	37	23	30	0	5	Scraper/collector-gatherer	4

Species	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Feeding Habits	Tolerance Value*
	June	Sept.	June	Sept.	June	Sept.		
Mayfly larvae (*Tricorythodes*)	40	8	0	8	0	0	Collector-gatherer	5
Grasshopper larvae (Orthoptera)	0	0	0	1	0	0		
Asian clam (*Corbicula*)	1	0	0	0	0	0	Filtering collector	6
Hellgrammite (*Corydalus*)	6	10	3	8	0	0	Predator	6
Water mite (Hydracarina)	0	0	0	0	0	1	Predator	6
Nematode (Nematoda)	0	0	0	0	0	3	Predator/collector-gatherer/shredder	5
Total benthic macroinvertebrates	**191**	**158**	**258**	**161**	**306**	**180**		
Total taxa	19	12	17	16	22	14		

*Tolerance to environmental stress values range from 0 (least tolerant) to 10 (most tolerant).

Table 13. Benthic Macroinvertebrates Collected from Rowlett, Rowlett Headwaters and Delaware Creeks in June and September 2019

Species	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Feeding Habits	Tolerance Value*
	June	Sept.	June	Sept.	June	Sept.		
Leeches (Hirudinea)	0	0	0	0	5	20	Predator	8
Caddisfly (*Cheumatopsyche*)	91	12	134	12	99	1	Filtering collector	6
Caddisfly (*Chimarra*)	3	21	4	84	7	13	Filtering collector	2
Caddisfly (*Hydropsyche*)	6	4	1	0	1	0	Filtering collector	5
Caddisfly (*Hydroptila*)	0	0	1	1	0	1	Scraper	2
Caddisfly (*Potamyia*)	0	0	0	0	1	0	Filtering collector	4
Scuds (*Hyallela*)	0	0	0	0	32	74	Collector-gatherer/ shredder	8

Species	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Feeding Habits	Tolerance Value*
	June	Sept.	June	Sept.	June	Sept.		
Seed shrimp (Ostracoda)	0	0	0	1	0	0	Collector-gatherer	
Snails (*Physella*)	0	0	0	0	1	7	Scraper	9
Horn snails (*Gyraulus*)	0	0	0	0	0	3	Scraper	8
Worms (Oligochaeta)	1	0	0	0	6	6	Collector-gatherer	8
Snout moth larvae (*Petrophila*)	0	8	0	1	2	0	Scraper	5
Damselfly larvae (*Argia*)	0	5	0	12	4	9	Predator	6
Damselfly larvae (*Hetaerina*)	1	0	1	0	0	0	Predator	6
Dragonfly larvae (*Erythemis*)	0	0	0	0	0	1	Predator	5
Flatworm (*Dugesia*)	6	0	2	0	0	0	Predator	7.5
Midge fly larvae (Chironomidae)	16	26	33	24	16	0	Predator/collector-gatherer/filtering collector	6
Midge fly larvae (*Probezzia*)	0	0	0	0	0	1	Predator	
Riffle beetle (*Stenelmis*)	0	0	0	0	5	29	Scraper/collector-gatherer	7
Crane fly (*Geranomyia*)	0	0	0	0	0	1	Shredder	
Black fly larvae (*Simulium*)	12	1	17	0	0	0	Filtering collector	4
Mayfly larvae (*Baetis*)	7	16	1	0	0	0	Scraper/collector-gatherer	4
Mayfly larvae (*Caenis*)	0	0	0	1	2	17	Scraper/collector-gatherer	7
Mayfly larvae (*Camelobaetidius*)	1	8	1	2	0	0	Scraper/collector-gatherer	4
Mayfly larvae (*Fallceon*)	44	42	11	10	2	3	Scraper/collector-gatherer	4

Species	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Feeding Habits	Tolerance Value*
	June	Sept.	June	Sept.	June	Sept.		
Mayfly larvae (*Isonychia*)	0	0	0	0	1	0	Filtering collector	3
Mayfly larvae (*Tricorythodes*)	1	54	0	0	0	0	Collector-gatherer	5
Fingernail clam (*Sphaerium*)	0	0	0	0	2	0	Filtering collector	5
Hellgrammite (*Corydalus*)	0	12	0	20	0	0	Predator	6
Water mite (Hydracarina)	0	2	0	0	0	0	Predator	6
Springtail (Collembola)	0	0	0	1	0	0	Collector-gatherer	
Hydra (*Hydra*)	0	0	0	0	1	0	Predator	
Total benthic macroinvertebrates	**↓189**	**↑211**	**↓206**	**↑169**	**↓187**	**↑186**		
Total taxa	↓12	↑13	↓11	↓12	↓17	↑15		

*Tolerance to environmental stress values range from 0 (least tolerant) to 10 (most tolerant).

Table 14. Benthic Macroinvertebrate Index of Biotic Integrity Metric Scores for Rowlett, Rowlett Headwaters and Delaware Creeks for June and September 2018

Metric	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Maximum Possible Score*
	June	Sept	June	Sept.	June	Sept	
Taxa Richness	3	2	3	3	4	2	4
Mayfly, stonefly, and caddisfly abundance	3	2	2	2	2	2	4
Hilsenhoff Biotic Index (tolerance to environmental stress)	1	3	3	3	1	2	4
% Chironomidae (midge flies) of total numbers	3	2	3	3	4	1	4
% of total numbers made up of dominant taxon	3	3	1	2	1	2	4
% of total numbers made up of dominant functional feeding group	3	3	1	2	4	1	4
% of total numbers that are predators	4	4	4	3	2	3	4
Ratio of number of intolerant to tolerant	1	2	1	2	1	1	4
% of total caddisflies that belong to the family Hydropsychidae	1	3	3	4	3	3	4
Number of non-insect taxa	3	1	2	2	4	4	4
% of total numbers that are collectors-gatherers	2	3	4	4	2	4	4
% of total numbers that are family Elmidae beetles	4	1	1	1	1	4	4
Total score	**31**	**29**	**28**	**31**	**29**	**29**	**48**
Aquatic life use category	*High*	*High*	*Intermediate*	*High*	*High*	*High*	*Exceptional*

*Benthic macroinvertebrate index of biotic integrity scores range from >36 exceptional, 29–36 high, 22–28 intermediate, and <22 limited.

Table 15. Benthic Macroinvertebrate Index of Biotic Integrity Metric Scores for Rowlett, Rowlett Headwaters and Delaware Creeks for June and September 2019

Metric	Rowlett Creek		Rowlett Creek Headwaters		Delaware Creek		Maximum Possible Score*
	June	Sept	June	Sept.	June	Sept	
Taxa Richness	↓2	2	↓2	↓2	↓3	↑3	4
Mayfly, stonefly, and caddisfly abundance	3	↑3	↑3	2	↑3	2	4
Hilsenhoff Biotic Index (tolerance to environmental stress)	1	↓2	↓1	3	1	↓1	4
% Chironomidae (midge flies) of total numbers	3	2	↓2	↓2	↓3	1	4
% of total numbers made up of dominant taxon	↓1	3	1	↓1	1	2	4
% of total numbers made up of dominant functional feeding group	↓1	↓2	1	↓1	↓1	↑4	4
% of total numbers that are predators	4	4	4	3	↑4	3	4
Ratio of number of intolerant to tolerant	1	2	1	↓1	1	1	4
% of total caddisflies that belong to the family Hydropsychidae	1	3	↓1	4	↓1	↑4	4
Number of non-insect taxa	↓2	1	↓1	↓1	4	↓3	4
% of total numbers that are collectors-gatherers	↑4	↓1	4	4	↑4	↓2	4
% of total numbers that are family Elmidae beetles	↓1	1	1	1	↑4	↓3	4
Total score	**↓24**	**↓26**	**↓22**	**↓25**	**↑30**	**29**	**48**
Aquatic life use category	*↓Intermediate*	*↓Intermediate*	*Intermediate*	*↓Intermediate*	*High*	*High*	*Exceptional*

*Benthic macroinvertebrate index of biotic integrity scores range from >36 exceptional, 29–36 high, 22–28 intermediate, and <22 limited.

5.0 REFERENCES

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Appendix E:

Lab Certifications and Accreditations

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate:	**T104704240-19-15**
Expiration Date:	**4/30/2020**
Issue Date:	**7/11/2019**

Armstrong Forensic Laboratory, Inc.

330 Loch'n Green Trail
Arlington, TX 76012-3458

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Method SM 4500-CN$^-$ C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20020808

Method SM 4500-CN$^-$ E

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20021209

Method SM 4500-H+ B

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	20104603

Method SM 4500-NH3 F

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	20023001

Method SM 5210 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5220 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	20027809

Method SM 9222 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total coliforms (enumeration)	TX	2500	20198009

Method SM 9222 B / 9222 G

Analyte	**AB**	**Analyte ID**	**Method ID**
Escherichia coli (enumeration)	TX	2525	20201201

Method SM 9222 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Fecal coliforms (enumeration)	TX	2530	20037405

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

A & B Environmental Services, Inc.

10100 East Freeway, Suite 100
Houston, TX 77029-1919

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704213-19-21
Effective Date: 8/26/2019
Expiration Date: 3/31/2020

Executive Director Texas Commission on Environmental Quality

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate:	**T104704366-19-18**
Expiration Date:	**9/30/2019**
Issue Date:	**4/1/2019**

Advanced Analytical Laboratories, LLC

15040 State Highway 110 South
Whitehouse, TX 75791

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Method ASTM D1426(A)

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	30023202

Method ASTM D516

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	30002201

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807

Method EPA 200.7

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10013806
Antimony	TX	1005	10013806
Arsenic	TX	1010	10013806
Barium	TX	1015	10013806
Beryllium	TX	1020	10013806
Boron	TX	1025	10013806
Cadmium	TX	1030	10013806
Calcium	TX	1035	10013806
Chromium	TX	1040	10013806
Cobalt	TX	1050	10013806
Copper	TX	1055	10013806
Iron	TX	1070	10013806
Lead	TX	1075	10013806
Magnesium	TX	1085	10013806
Manganese	TX	1090	10013806
Molybdenum	TX	1100	10013806
Nickel	TX	1105	10013806
Potassium	TX	1125	10013806
Selenium	TX	1140	10013806
Silver	TX	1150	10013806

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate:	**T104704366-19-18**
Expiration Date:	**9/30/2019**
Issue Date:	**4/1/2019**

Advanced Analytical Laboratories, LLC

15040 State Highway 110 South
Whitehouse, TX 75791

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Sodium	TX	1155	10013806
Strontium	TX	1160	10013806
Thallium	TX	1165	10013806
Tin	TX	1175	10013806
Titanium	TX	1180	10013806
Vanadium	TX	1185	10013806
Zinc	TX	1190	10013806

Method EPA 410.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	10077404

Method Hach Co. m-ColiBlue24® Test

Analyte	**AB**	**Analyte ID**	**Method ID**
Escherichia coli (enumeration)	TX	2525	60031007

Method SM 2310 B (4a)

Analyte	**AB**	**Analyte ID**	**Method ID**
Acidity, as CaCO3	TX	1500	20002806

Method SM 2320 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2510 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	20048004

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 4110 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	20076408

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704366-19-18
Expiration Date: 9/30/2019
Issue Date: 4/1/2019

Advanced Analytical Laboratories, LLC

15040 State Highway 110 South
Whitehouse, TX 75791

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Fluoride	TX	1730	20076408
Nitrate as N	TX	1810	20076408
Nitrite as N	TX	1840	20076408
Orthophosphate as P	TX	1870	20076408
Sulfate	TX	2000	20076408

Method SM 4500-Cl$^-$ C

Analyte	AB	Analyte ID	Method ID
Chloride	TX	1575	20084804

Method SM 4500-H+ B

Analyte	AB	Analyte ID	Method ID
pH	TX	1900	20104603

Method SM 5210 B

Analyte	AB	Analyte ID	Method ID
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704231-19-24

Expiration Date: 4/30/2020

Issue Date: 5/28/2019

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210
Houston, TX 77099-4338

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Drinking Water***

Method EPA 1613

Analyte	**AB**	**Analyte ID**	**Method ID**
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Copper	TX	1055	10014605
Lead	TX	1075	10014605

Matrix: *Non-Potable Water*

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 120.1

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	10006403

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 160.4

Analyte	AB	Analyte ID	Method ID
Residue-volatile	TX	1970	10010409

Method EPA 1613

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10120408
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10120408
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10120408
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10120408
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10120408
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10120408
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10120408
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10120408
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10120408
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10120408
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10120408
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10120408
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10120408
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10120408

Certificate:	**T104704231-19-24**
Expiration Date:	**4/30/2020**
Issue Date:	**5/28/2019**

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210
Houston, TX 77099-4338

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10120408
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10120408
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10120408
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10120408
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10120408
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10120408
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10120408
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10120408
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10120408
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10120408

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807

Method EPA 180.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	TX	2055	10011606

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Boron	TX	1025	10014605
Cadmium	TX	1030	10014605
Calcium	TX	1035	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605
Copper	TX	1055	10014605
Iron	TX	1070	10014605

Lead	TX	1075	10014605
Magnesium	TX	1085	10014605
Manganese	TX	1090	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Potassium	TX	1125	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Strontium	TX	1160	10014605
Thallium	TX	1165	10014605
Tin	TX	1175	10014605
Titanium	TX	1180	10014605
Uranium	TX	3035	10014605
Vanadium	TX	1185	10014605
Zinc	TX	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 325.1

Analyte	**AB**	**Analyte ID**	**Method ID**

Matrix: ***Non-Potable Water***

Chloride	TX	1575	10056801

Method EPA 335.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10060001

Method EPA 335.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	10278203

Method EPA 335.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	10061402

Method EPA 350.3

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	10064401

Method EPA 365.3

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

Method EPA 375.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10073800

Method EPA 376.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	TX	2005	10074201

Method EPA 410.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	10077404

Method EPA 415.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10078407

Method EPA 420.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10079400

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704231-19-24

Expiration Date: 4/30/2020

Issue Date: 5/28/2019

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210
Houston, TX 77099-4338

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Method EPA 420.4

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10080203

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Boron	TX	1025	10156419
Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Lithium	TX	1080	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419
Strontium	TX	1160	10156419
Thallium	TX	1165	10156419
Tin	TX	1175	10156419
Titanium	TX	1180	10156419

Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 608

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
alpha-Chlordane	TX	7240	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603
Aroclor-1248 (PCB-1248)	TX	8900	10103603
Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
Endrin ketone	TX	7535	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603
gamma-Chlordane	TX	7245	10103603
Heptachlor	TX	7685	10103603

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ALS Laboratory Group, Environmental Services Division (Houston, Texas)

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Matrix: ***Non-Potable Water***

Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603
Toxaphene (Chlorinated camphene)	TX	8250	10103603

Method EPA 624

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207
1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207
2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207
Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,2-Dichloroethylene	TX	4645	10107207

Matrix: ***Non-Potable Water***

cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
Naphthalene	TX	5005	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207
Vinyl chloride	TX	5235	10107207
Xylene (total)	TX	5260	10107207

Method EPA 625

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401
1,2,4-Trichlorobenzene	TX	5155	10107401
1,2-Dichlorobenzene	TX	4610	10107401
1,2-Diphenylhydrazine	TX	6220	10107401
1,3-Dichlorobenzene	TX	4615	10107401
1,4-Dichlorobenzene	TX	4620	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401

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Matrix: ***Non-Potable Water***

2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401
Acenaphthylene	TX	5505	10107401
Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401
Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401
Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401

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Matrix: ***Non-Potable Water***

Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401
n-Nitrosodi-n-butylamine	TX	5025	10107401
n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401
Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401
Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

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Matrix: ***Non-Potable Water***

Method EPA 8011

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,3-Trichloropropane	TX	5180	10173009
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10173009

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	TX	9369	10173203
Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203
Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

Method EPA 8021

Analyte	**AB**	**Analyte ID**	**Method ID**
Benzene	TX	4375	10174400
Ethylbenzene	TX	4765	10174400
m+p-xylene	TX	5240	10174400
Methyl tert-butyl ether (MTBE)	TX	5000	10174400
o-Xylene	TX	5250	10174400
Toluene	TX	5140	10174400
Xylene (total)	TX	5260	10174400

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402

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Matrix: *Non-Potable Water*

4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402
Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402
Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Hexachlorobenzene	TX	6275	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

Method EPA 8082

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201

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Matrix: ***Non-Potable Water***

Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8151

Analyte	AB	Analyte ID	Method ID
2,4,5-T	TX	8655	10183003
2,4-D	TX	8545	10183003
2,4-DB	TX	8560	10183003
Dalapon	TX	8555	10183003
Dicamba	TX	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183003
MCPA	TX	7775	10183003
MCPP	TX	7780	10183003
Silvex (2,4,5-TP)	TX	8650	10183003

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404

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Matrix: ***Non-Potable Water***

1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
2-Pentanone	TX	5045	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404
Allyl alcohol	TX	4350	10184404
Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404

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Matrix: ***Non-Potable Water***

Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404
Di-isopropylether (DIPE)	TX	9375	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404
Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	TX	4770	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404

Matrix: ***Non-Potable Water***

Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
T-amylmethylether (TAME)	TX	4370	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

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Matrix: ***Non-Potable Water***

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203
2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203

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Issue Date: 5/28/2019

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Matrix: ***Non-Potable Water***

2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203
4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Dimethyl aminoazobenzene	TX	6105	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrobiphenyl	TX	6480	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Chloro-2-methylaniline	TX	5695	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203
Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Captan	TX	7190	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203

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Matrix: ***Non-Potable Water***

Chrysene	TX	5855	10185203
Coumaphos	TX	7315	10185203
Demeton	TX	7390	10185203
Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Dioxathion	TX	7495	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethion	TX	7565	10185203
Ethyl methanesulfonate	TX	6260	10185203
Famphur	TX	7580	10185203
Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203

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Matrix: ***Non-Potable Water***

Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203
Kepone	TX	7740	10185203
Maleic anhydride	TX	6335	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naled	TX	7905	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203
n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203

Matrix: *Non-Potable Water*

Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Phosmet (Imidan)	TX	8000	10185203
Phthalic anhydride	TX	6640	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203
Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Resorcinol	TX	6680	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203
Toluene diisocyanate	TX	6775	10185203
Trifluralin (Treflan)	TX	8295	10185203

Method EPA 8290

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209

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Matrix: ***Non-Potable Water***

1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

Method EPA 8316

Analyte	AB	Analyte ID	Method ID
Acrylamide	TX	4330	10188202

Method EPA 8330

Analyte	AB	Analyte ID	Method ID
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807

Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9038

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10196608

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	10196802

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10200201

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Matrix: ***Non-Potable Water***

Method EPA 9065

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10200405

Method EPA 9066

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10200609

Method EPA 9250

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	10207202

Method EPA RSK 175

Analyte	**AB**	**Analyte ID**	**Method ID**
2-methylpropane (Isobutane)	TX	4942	10212905
Ethane	TX	4747	10212905
Ethene	TX	4752	10212905
Methane	TX	4926	10212905
n-Butane	TX	5007	10212905
n-Propane	TX	5029	10212905

Method HACH 8000

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	60003001

Method SM 2120 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Color	TX	1605	20223807

Method SM 2310 B (4a)

Analyte	**AB**	**Analyte ID**	**Method ID**
Acidity, as CaCO3	TX	1500	20002806

Method SM 2320 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2340 B

Analyte	**AB**	**Analyte ID**	**Method ID**

Matrix: ***Non-Potable Water***

Total hardness as CaCO3	TX	1755	20046008

Method SM 2510 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	20048004

Method SM 2540 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	TX	1950	20004608

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 3500-Cr B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	20065809

Method SM 4500-Cl F

Analyte	**AB**	**Analyte ID**	**Method ID**
Total residual chlorine	TX	1940	20080482

Method SM 4500-Cl$^-$ E

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	20019209

Method SM 4500-CN$^-$ C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20020808

Method SM 4500-CN$^-$ E

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20021209

Method SM 4500-CN$^-$ G

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	20021607

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Matrix: ***Non-Potable Water***

Method SM 4500-H+ B

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	20104603

Method SM 4500-NH3 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	20108809
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	TX	1790	20108809

Method SM 4500-NH3 F

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	20023001

Method SM 4500-O G

Analyte	**AB**	**Analyte ID**	**Method ID**
Oxygen, dissolved	TX	1880	20025405

Method SM 4500-P E

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	TX	1870	20025803
Phosphorus	TX	1910	20025803

Method SM 4500-S2^{-} D

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	TX	2005	20125400

Method SM 4500-S2^{-} F

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	TX	2005	20126209

Method SM 4500-SiO2 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Silica as SiO2	TX	1990	20127202

Method SM 4500-SO3^{-} B

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfite	TX	2015	20026806

Method SM 5210 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Biochemical oxygen demand (BOD)	TX	1530	20027401

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Matrix: ***Non-Potable Water***

Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5310 B

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	20137206

Method SM 5310 C

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	20138209

Method SM 5540 C

Analyte	AB	Analyte ID	Method ID
Surfactants - MBAS	TX	2025	20144405

Method TCEQ 1005

Analyte	AB	Analyte ID	Method ID
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

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Matrix: ***Solid & Chemical Materials***

Method ASTM D2216

Analyte	AB	Analyte ID	Method ID
Moisture	TX	10337	ASTM D2216-05

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 1030

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10117201

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 1668

Analyte	AB	Analyte ID	Method ID
Decachlorobiphenyls	TX	10332	10262007
Dichlorobiphenyls	TX	464	10262007
Heptachlorobiphenyls	TX	486	10262007
Hexachlorobiphenyls	TX	487	10262007
Monochlorobiphenyls	TX	501	10262007
Nonachlorobiphenyls	TX	507	10262007
Octachlorobiphenyls	TX	508	10262007
Pentachlorobiphenyls	TX	515	10262007
Tetrachlorobiphenyls	TX	528	10262007
Trichlorobiphenyls	TX	541	10262007

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Uranium	TX	3035	10014605

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Matrix: ***Solid & Chemical Materials***

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 310.1

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	10054805

Method EPA 350.3

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10064401

Method EPA 365.3

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156204
Antimony	TX	1005	10156204
Arsenic	TX	1010	10156204
Barium	TX	1015	10156204
Beryllium	TX	1020	10156204
Boron	TX	1025	10156204
Cadmium	TX	1030	10156204
Calcium	TX	1035	10156204
Chromium	TX	1040	10156204

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Matrix: ***Solid & Chemical Materials***

Cobalt	TX	1050	10156204
Copper	TX	1055	10156204
Iron	TX	1070	10156204
Lead	TX	1075	10156204
Lithium	TX	1080	10156204
Magnesium	TX	1085	10156204
Manganese	TX	1090	10156204
Molybdenum	TX	1100	10156204
Nickel	TX	1105	10156204
Potassium	TX	1125	10156204
Selenium	TX	1140	10156204
Silver	TX	1150	10156204
Sodium	TX	1155	10156204
Strontium	TX	1160	10156204
Thallium	TX	1165	10156204
Tin	TX	1175	10156204
Titanium	TX	1180	10156204
Vanadium	TX	1185	10156204
Zinc	TX	1190	10156204

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10166004

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	TX	9369	10173203

Matrix: ***Solid & Chemical Materials***

Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203
Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

Method EPA 8021

Analyte	**AB**	**Analyte ID**	**Method ID**
Benzene	TX	4375	10174400
Ethylbenzene	TX	4765	10174400
m+p-xylene	TX	5240	10174400
Methyl tert-butyl ether (MTBE)	TX	5000	10174400
o-Xylene	TX	5250	10174400
Toluene	TX	5140	10174400
Xylene (total)	TX	5260	10174400

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402
4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402

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Matrix: ***Solid & Chemical Materials***

Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402
Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201
Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404

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Matrix: ***Solid & Chemical Materials***

1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404

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Matrix: ***Solid & Chemical Materials***

Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404
Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404

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Matrix: ***Solid & Chemical Materials***

Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404

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Matrix: ***Solid & Chemical Materials***

Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203

Matrix: ***Solid & Chemical Materials***

2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203
2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203
4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203

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Matrix: ***Solid & Chemical Materials***

Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203
Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203
Chrysene	TX	5855	10185203

Matrix: *Solid & Chemical Materials*

Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzo(a,e) pyrene	TX	5890	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethyl methanesulfonate	TX	6260	10185203
Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203
Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203

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Matrix: ***Solid & Chemical Materials***

Kepone	TX	7740	10185203
Malathion	TX	7770	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203
n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203
Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203

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Matrix: ***Solid & Chemical Materials***

Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203
Toluene diisocyanate	TX	6775	10185203

Method EPA 8290

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

ALS Laboratory Group, Environmental Services Division (Houston, Texas)	Certificate:	T104704231-19-24
	Expiration Date:	4/30/2020
10450 Stancliff Road, Suite 210 Houston, TX 77099-4338	Issue Date:	5/28/2019

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Solid & Chemical Materials***

Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

Method EPA 8316

Analyte	AB	Analyte ID	Method ID
Acrylamide	TX	4330	10188202

Method EPA 8330

Analyte	AB	Analyte ID	Method ID
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

Method EPA 9014

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9038

Analyte	AB	Analyte ID	Method ID
Sulfate	TX	2000	10196608

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

	Certificate:	**T104704231-19-24**
ALS Laboratory Group, Environmental Services Division (Houston, Texas)	**Expiration Date:**	**4/30/2020**
10450 Stancliff Road, Suite 210 **Houston, TX 77099-4338**	**Issue Date:**	**5/28/2019**

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Matrix: ***Solid & Chemical Materials***

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10197203
pH	TX	1900	10196802

Method EPA 9045

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10197805
pH	TX	1900	10197805

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10200201

Method EPA 9065

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10200405

Method EPA 9071

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10201204

Texas Commission on Environmental Quality

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Issue Date: 5/28/2019

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

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Matrix: ***Solid & Chemical Materials***

Method EPA 9095

Analyte	AB	Analyte ID	Method ID
Paint Filter Liquids Test	TX	10312	10204009

Method EPA 9250

Analyte	AB	Analyte ID	Method ID
Chloride	TX	1575	10207202

Method SM 2320 B

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2510 B

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	20048004

Method SM 2540 G

Analyte	AB	Analyte ID	Method ID
Residue-total (total solids)	TX	1950	20005203

Method SSA/ASA Part 3:34

Analyte	AB	Analyte ID	Method ID
Carbon, organic (Walkley-Black)	TX	10340	SSA/ASA Pt 3:34

Method TCEQ 1005

Analyte	AB	Analyte ID	Method ID
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704231-18-22
Expiration Date: 4/30/2019
Issue Date: 8/3/2018

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Houston, TX 77099-4338

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Matrix: ***Drinking Water***

Method EPA 1613

Analyte	**AB**	**Analyte ID**	**Method ID**
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Copper	TX	1055	10014605
Lead	TX	1075	10014605

Certificate:	**T104704231-18-22**
Expiration Date:	**4/30/2019**
Issue Date:	**8/3/2018**

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

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Matrix: ***Non-Potable Water***

Method EPA 1010

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	TX	1780	10116606

Method EPA 110.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Color	TX	1605	10005206

Method EPA 120.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10006403

Method EPA 1311

Analyte	**AB**	**Analyte ID**	**Method ID**
TCLP	TX	849	10118806

Method EPA 1312

Analyte	**AB**	**Analyte ID**	**Method ID**
SPLP	TX	850	10119003

Method EPA 150.1

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	10008409

Method EPA 160.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	10009208

Method EPA 160.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	TX	1960	10009606

Method EPA 160.3

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	TX	1950	10010001

Method EPA 160.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-volatile	TX	1970	10010409

Method EPA 1613

Analyte	**AB**	**Analyte ID**	**Method ID**

Certificate: T104704231-18-22

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

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Issue Date: 8/3/2018

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Matrix: ***Non-Potable Water***

1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10120408
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10120408
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10120408
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10120408
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10120408
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10120408
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10120408
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10120408
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10120408
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10120408
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10120408
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10120408
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10120408
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10120408
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10120408
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10120408
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10120408
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10120408
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10120408
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10120408
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10120408
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10120408
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10120408
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10120408
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10120408

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807

Method EPA 180.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	TX	2055	10011606

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704231-18-22

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

Expiration Date: 4/30/2019

10450 Stancliff Road, Suite 210
Houston, TX 77099-4338

Issue Date: 8/3/2018

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Matrix: ***Non-Potable Water***

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Boron	TX	1025	10014605
Cadmium	TX	1030	10014605
Calcium	TX	1035	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605
Copper	TX	1055	10014605
Iron	TX	1070	10014605
Lead	TX	1075	10014605
Magnesium	TX	1085	10014605
Manganese	TX	1090	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Potassium	TX	1125	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Strontium	TX	1160	10014605
Thallium	TX	1165	10014605
Tin	TX	1175	10014605
Titanium	TX	1180	10014605
Uranium	TX	3035	10014605
Vanadium	TX	1185	10014605
Zinc	TX	1190	10014605

Certificate: T104704231-18-22
Expiration Date: 4/30/2019
Issue Date: 8/3/2018

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

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Matrix: ***Non-Potable Water***

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 305.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Acidity, as CaCO3	TX	1500	10276207

Method EPA 310.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	10054805

Method EPA 325.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	10056801

Method EPA 335.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10060001

Method EPA 335.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	10278203

Method EPA 335.3

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	10061004

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

Method EPA 335.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	10061402

Method EPA 350.3

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	10064401

Method EPA 351.3

Analyte	**AB**	**Analyte ID**	**Method ID**
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	TX	1790	10065802

Method EPA 360.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Oxygen, dissolved	TX	1880	10069008

Method EPA 365.3

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

Method EPA 375.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10073800

Method EPA 376.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	TX	2005	10074201

Method EPA 405.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Biochemical oxygen demand (BOD)	TX	1530	10075602
Carbonaceous BOD, CBOD	TX	1555	10075602

Method EPA 410.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	10077404

Method EPA 415.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10078407

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Matrix: ***Non-Potable Water***

Method EPA 420.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10079400

Method EPA 420.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10080203

Method EPA 425.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Surfactants - MBAS	TX	2025	10080601

Method EPA 602

Analyte	**AB**	**Analyte ID**	**Method ID**
Benzene	TX	4375	10102202
Ethylbenzene	TX	4765	10102202
m+p-xylene	TX	5240	10102202
Methyl tert-butyl ether (MTBE)	TX	5000	10102202
o-Xylene	TX	5250	10102202
Toluene	TX	5140	10102202
Xylene (total)	TX	5260	10102202

Method EPA 6020

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Boron	TX	1025	10156419
Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419

Certificate: T104704231-18-22

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Matrix: ***Non-Potable Water***

Iron	TX	1070	10156419
Lead	TX	1075	10156419
Lithium	TX	1080	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419
Strontium	TX	1160	10156419
Thallium	TX	1165	10156419
Tin	TX	1175	10156419
Titanium	TX	1180	10156419
Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 608

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
alpha-Chlordane	TX	7240	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603
Aroclor-1248 (PCB-1248)	TX	8900	10103603

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Matrix: ***Non-Potable Water***

Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
Endrin ketone	TX	7535	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603
gamma-Chlordane	TX	7245	10103603
Heptachlor	TX	7685	10103603
Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603
Toxaphene (Chlorinated camphene)	TX	8250	10103603

Method EPA 624

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207

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Matrix: ***Non-Potable Water***

1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207
2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207
Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,2-Dichloroethylene	TX	4645	10107207
cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
Naphthalene	TX	5005	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207

Matrix: ***Non-Potable Water***

Vinyl chloride	TX	5235	10107207
Xylene (total)	TX	5260	10107207

Method EPA 625

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401
1,2,4-Trichlorobenzene	TX	5155	10107401
1,2-Dichlorobenzene	TX	4610	10107401
1,2-Diphenylhydrazine	TX	6220	10107401
1,3-Dichlorobenzene	TX	4615	10107401
1,4-Dichlorobenzene	TX	4620	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401
2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401

Certificate: T104704231-18-22

Expiration Date: 4/30/2019

Issue Date: 8/3/2018

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

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Matrix: ***Non-Potable Water***

Acenaphthylene	TX	5505	10107401
Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401
Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401
Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401
Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401

Matrix: *Non-Potable Water*

n-Nitrosodi-n-butylamine	TX	5025	10107401
n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401
Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401
Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

Method EPA 8011

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,3-Trichloropropane	TX	5180	10173009
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10173009

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	TX	9369	10173203
Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203

Matrix: ***Non-Potable Water***

Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

Method EPA 8021

Analyte	**AB**	**Analyte ID**	**Method ID**
Benzene	TX	4375	10174400
Ethylbenzene	TX	4765	10174400
m+p-xylene	TX	5240	10174400
Methyl tert-butyl ether (MTBE)	TX	5000	10174400
o-Xylene	TX	5250	10174400
Toluene	TX	5140	10174400
Xylene (total)	TX	5260	10174400

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402
4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402
Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402

Matrix: *Non-Potable Water*

Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Hexachlorobenzene	TX	6275	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

Method EPA 8082

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201
Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8151

Analyte	AB	Analyte ID	Method ID
2,4,5-T	TX	8655	10183003
2,4-D	TX	8545	10183003
2,4-DB	TX	8560	10183003
Dalapon	TX	8555	10183003
Dicamba	TX	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183003
MCPA	TX	7775	10183003
MCPP	TX	7780	10183003
Silvex (2,4,5-TP)	TX	8650	10183003

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184404

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ALS Laboratory Group, Environmental Services Division (Houston, Texas)

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Matrix: ***Non-Potable Water***

1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
2-Pentanone	TX	5045	10184404
4-Chlorotoluene	TX	4540	10184404

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Matrix: ***Non-Potable Water***

4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404
Allyl alcohol	TX	4350	10184404
Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404
Di-isopropylether (DIPE)	TX	9375	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404

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Matrix: ***Non-Potable Water***

Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	TX	4770	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404
Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404

Matrix: ***Non-Potable Water***

T-amylmethylether (TAME)	TX	4370	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203
1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203

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Issue Date: 8/3/2018

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Matrix: ***Non-Potable Water***

2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203
2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203
2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203
4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203

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Matrix: ***Non-Potable Water***

4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Dimethyl aminoazobenzene	TX	6105	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrobiphenyl	TX	6480	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Chloro-2-methylaniline	TX	5695	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203
Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203

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Matrix: ***Non-Potable Water***

Benzoic acid	TX	5610	10185203
Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Captan	TX	7190	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203
Chrysene	TX	5855	10185203
Coumaphos	TX	7315	10185203
Demeton	TX	7390	10185203
Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203

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Houston, TX 77099-4338

Issue Date: 8/3/2018

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Matrix: *Non-Potable Water*

Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Dioxathion	TX	7495	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethion	TX	7565	10185203
Ethyl methanesulfonate	TX	6260	10185203
Famphur	TX	7580	10185203
Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203
Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203
Kepone	TX	7740	10185203
Maleic anhydride	TX	6335	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naled	TX	7905	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203

Certificate: T104704231-18-22

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

Expiration Date: 4/30/2019

10450 Stancliff Road, Suite 210
Houston, TX 77099-4338

Issue Date: 8/3/2018

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Matrix: ***Non-Potable Water***

n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203
o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203
Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Phosmet (Imidan)	TX	8000	10185203
Phthalic anhydride	TX	6640	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203
Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Resorcinol	TX	6680	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203

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Matrix: ***Non-Potable Water***

Toluene diisocyanate	TX	6775	10185203
Trifluralin (Treflan)	TX	8295	10185203

Method EPA 8280

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10186808
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10186808
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10186808
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10186808
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10186808
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10186808
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10186808
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10186808
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10186808
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10186808
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10186808
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10186808
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10186808
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10186808
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10186808
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10186808
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10186808
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10186808
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10186808
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10186808
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10186808
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10186808
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10186808
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10186808
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10186808

Method EPA 8290

Analyte	**AB**	**Analyte ID**	**Method ID**

Matrix: ***Non-Potable Water***

1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

Method EPA 8315

Analyte	AB	Analyte ID	Method ID
Formaldehyde	TX	4815	10187801

Method EPA 8316

Analyte	AB	Analyte ID	Method ID
Acrylamide	TX	4330	10188202

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Matrix: *Non-Potable Water*

Method EPA 8330

Analyte	AB	Analyte ID	Method ID
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807
4-Nitrotoluene	TX	9513	10189807
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

Method EPA 9012

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	10243206
Total cyanide	TX	1645	10243206

Method EPA 9014

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9038

Analyte	AB	Analyte ID	Method ID
Sulfate	TX	2000	10196608

Method EPA 9040

Analyte	AB	Analyte ID	Method ID
pH	TX	1900	10196802

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

Method EPA 9050

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	10200201

Method EPA 9065

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200405

Method EPA 9066

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200609

Method EPA 9250

Analyte	AB	Analyte ID	Method ID
Chloride	TX	1575	10207202

Method EPA RSK 175

Analyte	AB	Analyte ID	Method ID
2-methylpropane (Isobutane)	TX	4942	10212905
Ethane	TX	4747	10212905
Ethene	TX	4752	10212905
Methane	TX	4926	10212905

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Matrix: ***Non-Potable Water***

n-Butane	TX	5007	10212905
n-Propane	TX	5029	10212905

Method HACH 8000

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	60003001

Method SM 2120 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Color	TX	1605	20223807

Method SM 2310 B (4a)

Analyte	**AB**	**Analyte ID**	**Method ID**
Acidity, as CaCO3	TX	1500	20002806

Method SM 2320 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2340 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total hardness as CaCO3	TX	1755	20046008

Method SM 2510 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	20048004

Method SM 2540 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	TX	1950	20004608

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 3500-Cr B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	20065809

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Matrix: ***Non-Potable Water***

Method SM 4500-Cl F

Analyte	**AB**	**Analyte ID**	**Method ID**
Total residual chlorine	TX	1940	20080482

Method SM 4500-Cl^- E

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	20019209

Method SM 4500-CN^- C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20020808

Method SM 4500-CN^- E

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20021209

Method SM 4500-CN^- G

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	20021607

Method SM 4500-H+ B

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	20104603

Method SM 4500-NH3 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	20108809
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	TX	1790	20108809

Method SM 4500-NH3 F

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	20023001

Method SM 4500-O G

Analyte	**AB**	**Analyte ID**	**Method ID**
Oxygen, dissolved	TX	1880	20025405

Method SM 4500-P E

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	TX	1870	20025803
Phosphorus	TX	1910	20025803

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Matrix: ***Non-Potable Water***

Method SM 4500-S2^{-} F

Analyte	AB	Analyte ID	Method ID
Sulfide	TX	2005	20126209

Method SM 4500-SiO2 D

Analyte	AB	Analyte ID	Method ID
Silica as SiO2	TX	1990	20127202

Method SM 4500-SO3^{-} B

Analyte	AB	Analyte ID	Method ID
Sulfite	TX	2015	20026806

Method SM 5210 B

Analyte	AB	Analyte ID	Method ID
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5310 B

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	20137206

Method SM 5310 C

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	20138209

Method SM 5540 C

Analyte	AB	Analyte ID	Method ID
Surfactants - MBAS	TX	2025	20144405

Method TCEQ 1005

Analyte	AB	Analyte ID	Method ID
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

Texas Commission on Environmental Quality

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Matrix: ***Solid & Chemical Materials***

Method ASTM D2216

Analyte	**AB**	**Analyte ID**	**Method ID**
Moisture	TX	10337	ASTM D2216-05

Method EPA 1010

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	TX	1780	10116606

Method EPA 1030

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	TX	1780	10117201

Method EPA 1311

Analyte	**AB**	**Analyte ID**	**Method ID**
TCLP	TX	849	10118806

Method EPA 1312

Analyte	**AB**	**Analyte ID**	**Method ID**
SPLP	TX	850	10119003

Method EPA 1668

Analyte	**AB**	**Analyte ID**	**Method ID**
Decachlorobiphenyls	TX	10332	10262007
Dichlorobiphenyls	TX	464	10262007
Heptachlorobiphenyls	TX	486	10262007
Hexachlorobiphenyls	TX	487	10262007
Monochlorobiphenyls	TX	501	10262007
Nonachlorobiphenyls	TX	507	10262007
Octachlorobiphenyls	TX	508	10262007
Pentachlorobiphenyls	TX	515	10262007
Tetrachlorobiphenyls	TX	528	10262007
Trichlorobiphenyls	TX	541	10262007

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Uranium	TX	3035	10014605

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Matrix: ***Solid & Chemical Materials***

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 310.1

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	10054805

Method EPA 350.3

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10064401

Method EPA 365.3

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	10070801
Phosphorus	TX	1910	10070801

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156204
Antimony	TX	1005	10156204
Arsenic	TX	1010	10156204
Barium	TX	1015	10156204
Beryllium	TX	1020	10156204
Boron	TX	1025	10156204
Cadmium	TX	1030	10156204
Calcium	TX	1035	10156204
Chromium	TX	1040	10156204

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Matrix: ***Solid & Chemical Materials***

Cobalt	TX	1050	10156204
Copper	TX	1055	10156204
Iron	TX	1070	10156204
Lead	TX	1075	10156204
Lithium	TX	1080	10156204
Magnesium	TX	1085	10156204
Manganese	TX	1090	10156204
Molybdenum	TX	1100	10156204
Nickel	TX	1105	10156204
Potassium	TX	1125	10156204
Selenium	TX	1140	10156204
Silver	TX	1150	10156204
Sodium	TX	1155	10156204
Strontium	TX	1160	10156204
Thallium	TX	1165	10156204
Tin	TX	1175	10156204
Titanium	TX	1180	10156204
Vanadium	TX	1185	10156204
Zinc	TX	1190	10156204

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10166004

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	TX	9369	10173203

Matrix: ***Solid & Chemical Materials***

Ethanol	TX	4750	10173203
Ethylene glycol	TX	4785	10173203
Gasoline range organics (GRO)	TX	9408	10173203
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10173203
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10173203
Methanol	TX	4930	10173203
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10173203
n-Propanol (1-Propanol)	TX	5055	10173203
Propylene Glycol	TX	6657	10173203
tert-Butyl alcohol	TX	4420	10173203

Method EPA 8021

Analyte	**AB**	**Analyte ID**	**Method ID**
Benzene	TX	4375	10174400
Ethylbenzene	TX	4765	10174400
m+p-xylene	TX	5240	10174400
Methyl tert-butyl ether (MTBE)	TX	5000	10174400
o-Xylene	TX	5250	10174400
Toluene	TX	5140	10174400
Xylene (total)	TX	5260	10174400

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178402
4,4'-DDE	TX	7360	10178402
4,4'-DDT	TX	7365	10178402
Aldrin	TX	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178402
alpha-Chlordane	TX	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178402
Chlordane (tech.)	TX	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178402
Dieldrin	TX	7470	10178402

Certificate: T104704231-18-22

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

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Houston, TX 77099-4338

Issue Date: 8/3/2018

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Matrix: ***Solid & Chemical Materials***

Endosulfan I	TX	7510	10178402
Endosulfan II	TX	7515	10178402
Endosulfan sulfate	TX	7520	10178402
Endrin	TX	7540	10178402
Endrin aldehyde	TX	7530	10178402
Endrin ketone	TX	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178402
gamma-Chlordane	TX	7245	10178402
Heptachlor	TX	7685	10178402
Heptachlor epoxide	TX	7690	10178402
Methoxychlor	TX	7810	10178402
Mirex	TX	7870	10178402
Toxaphene (Chlorinated camphene)	TX	8250	10178402

Method EPA 8082

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201
Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8151

Analyte	AB	Analyte ID	Method ID
2,4,5-T	TX	8655	10183003
2,4-D	TX	8545	10183003
2,4-DB	TX	8560	10183003
Dalapon	TX	8555	10183003
Dicamba	TX	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183003

Matrix: ***Solid & Chemical Materials***

Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183003
MCPA	TX	7775	10183003
MCPP	TX	7780	10183003
Silvex (2,4,5-TP)	TX	8650	10183003

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
1-Propanol	TX	5060	10184404

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Matrix: ***Solid & Chemical Materials***

2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404
Allyl chloride (3-Chloropropene)	TX	4355	10184404
Benzene	TX	4375	10184404
Benzyl chloride	TX	5635	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404

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Matrix: ***Solid & Chemical Materials***

Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Diethyl ether	TX	4725	10184404
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184404
Ethanol	TX	4750	10184404
Ethyl acetate	TX	4755	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethylene oxide	TX	4795	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methacrylonitrile	TX	4925	10184404
Methyl acetate	TX	4940	10184404
Methyl acrylate	TX	4945	10184404
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl methacrylate	TX	4990	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184404
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	TX	4425	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
Pentachloroethane	TX	5035	10184404
Propionitrile (Ethyl cyanide)	TX	5080	10184404

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Matrix: ***Solid & Chemical Materials***

Pyridine	TX	5095	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10185203
1,2,4-Trichlorobenzene	TX	5155	10185203
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10185203
1,2-Dichlorobenzene	TX	4610	10185203
1,2-Dinitrobenzene	TX	6155	10185203
1,2-Diphenylhydrazine	TX	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10185203
1,3-Dichlorobenzene	TX	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185203
1,4-Dichlorobenzene	TX	4620	10185203
1,4-Dinitrobenzene	TX	6165	10185203
1,4-Naphthoquinone	TX	6420	10185203
1,4-Phenylenediamine	TX	6630	10185203

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Matrix: ***Solid & Chemical Materials***

1-Chloronaphthalene	TX	5790	10185203
1-Naphthylamine	TX	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185203
2,3,4,6-Tetrachlorophenol	TX	6735	10185203
2,4,5-Trichlorophenol	TX	6835	10185203
2,4,5-Trimethylaniline	TX	6880	10185203
2,4,6-Trichlorophenol	TX	6840	10185203
2,4-Diaminotoluene	TX	5880	10185203
2,4-Dichlorophenol	TX	6000	10185203
2,4-Dimethylphenol	TX	6130	10185203
2,4-Dinitrophenol	TX	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185203
2,6-Dichlorophenol	TX	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185203
2-Acetylaminofluorene	TX	5515	10185203
2-Chloronaphthalene	TX	5795	10185203
2-Chlorophenol	TX	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185203
2-Methylaniline (o-Toluidine)	TX	5145	10185203
2-Methylnaphthalene	TX	6385	10185203
2-Methylphenol (o-Cresol)	TX	6400	10185203
2-Naphthylamine	TX	6430	10185203
2-Nitroaniline	TX	6460	10185203
2-Nitrophenol	TX	6490	10185203
2-Picoline (2-Methylpyridine)	TX	5050	10185203
3,3'-Dichlorobenzidine	TX	5945	10185203
3,3'-Dimethylbenzidine	TX	6120	10185203
3-Methylcholanthrene	TX	6355	10185203
3-Methylphenol (m-Cresol)	TX	6405	10185203
3-Nitroaniline	TX	6465	10185203

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Matrix: ***Solid & Chemical Materials***

4-Aminobiphenyl	TX	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185203
4-Chloro-3-methylphenol	TX	5700	10185203
4-Chloroaniline	TX	5745	10185203
4-Chlorophenyl phenylether	TX	5825	10185203
4-Methylphenol (p-Cresol)	TX	6410	10185203
4-Nitroaniline	TX	6470	10185203
4-Nitrophenol	TX	6500	10185203
4-Nitroquinoline-1-oxide	TX	6510	10185203
5-Nitro-o-toluidine	TX	6570	10185203
7,12-Dimethylbenz(a) anthracene	TX	6115	10185203
a-a-Dimethylphenethylamine	TX	6125	10185203
Acenaphthene	TX	5500	10185203
Acenaphthylene	TX	5505	10185203
Acetophenone	TX	5510	10185203
Aniline	TX	5545	10185203
Anthracene	TX	5555	10185203
Aramite	TX	5560	10185203
Atrazine	TX	7065	10185203
Azinphos-methyl (Guthion)	TX	7075	10185203
Azobenzene	TX	5562	10185203
Benzenethiol (Thiophenol)	TX	6750	10185203
Benzidine	TX	5595	10185203
Benzo(a)anthracene	TX	5575	10185203
Benzo(a)pyrene	TX	5580	10185203
Benzo(b)fluoranthene	TX	5585	10185203
Benzo(e)pyrene	TX	5605	10185203
Benzo(g,h,i)perylene	TX	5590	10185203
Benzo(k)fluoranthene	TX	5600	10185203
Benzoic acid	TX	5610	10185203

Matrix: ***Solid & Chemical Materials***

Benzyl alcohol	TX	5630	10185203
Biphenyl	TX	5640	10185203
bis(2-Chloroethoxy)methane	TX	5760	10185203
bis(2-Chloroethyl) ether	TX	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185203
Butyl benzyl phthalate	TX	5670	10185203
Caprolactam	TX	7180	10185203
Carbaryl (Sevin)	TX	7195	10185203
Carbazole	TX	5680	10185203
Carbophenothion	TX	7220	10185203
Chlorobenzilate	TX	7260	10185203
Chrysene	TX	5855	10185203
Demeton	TX	7390	10185203
Demeton-o	TX	7395	10185203
Demeton-s	TX	7385	10185203
Diallate	TX	7405	10185203
Dibenz(a,h) anthracene	TX	5895	10185203
Dibenz(a,j) acridine	TX	5900	10185203
Dibenzo(a,e) pyrene	TX	5890	10185203
Dibenzofuran	TX	5905	10185203
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10185203
Diethyl phthalate	TX	6070	10185203
Dimethoate	TX	7475	10185203
Dimethyl phthalate	TX	6135	10185203
Di-n-butyl phthalate	TX	5925	10185203
Di-n-octyl phthalate	TX	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10185203
Diphenylamine	TX	6205	10185203
Disulfoton	TX	8625	10185203
Ethyl methanesulfonate	TX	6260	10185203

Matrix: ***Solid & Chemical Materials***

Fluoranthene	TX	6265	10185203
Fluorene	TX	6270	10185203
Hexachlorobenzene	TX	6275	10185203
Hexachlorobutadiene	TX	4835	10185203
Hexachlorocyclopentadiene	TX	6285	10185203
Hexachloroethane	TX	4840	10185203
Hexachlorophene	TX	6290	10185203
Hexachloropropene	TX	6295	10185203
Indeno(1,2,3-cd) pyrene	TX	6315	10185203
Isodrin	TX	7725	10185203
Isophorone	TX	6320	10185203
Isosafrole	TX	6325	10185203
Kepone	TX	7740	10185203
Malathion	TX	7770	10185203
Methapyrilene	TX	6345	10185203
Methyl methanesulfonate	TX	6375	10185203
Methyl parathion (Parathion, methyl)	TX	7825	10185203
Mevinphos	TX	7850	10185203
Naphthalene	TX	5005	10185203
Nitrobenzene	TX	5015	10185203
n-Nitrosodiethylamine	TX	6525	10185203
n-Nitrosodimethylamine	TX	6530	10185203
n-Nitrosodi-n-butylamine	TX	5025	10185203
n-Nitrosodi-n-propylamine	TX	6545	10185203
n-Nitrosodiphenylamine	TX	6535	10185203
n-Nitrosomethylethylamine	TX	6550	10185203
n-Nitrosomorpholine	TX	6555	10185203
n-Nitrosopiperidine	TX	6560	10185203
n-Nitrosopyrrolidine	TX	6565	10185203
o,o,o-Triethyl phosphorothioate	TX	8290	10185203

Matrix: ***Solid & Chemical Materials***

o-Anisidine	TX	5550	10185203
Parathion, ethyl	TX	7955	10185203
p-Cresidine	TX	5860	10185203
Pentachlorobenzene	TX	6590	10185203
Pentachloronitrobenzene (PCNB)	TX	6600	10185203
Pentachlorophenol	TX	6605	10185203
Phenacetin	TX	6610	10185203
Phenanthrene	TX	6615	10185203
Phenol	TX	6625	10185203
Phorate	TX	7985	10185203
Pronamide (Kerb)	TX	6650	10185203
Pyrene	TX	6665	10185203
Pyridine	TX	5095	10185203
Quinoline	TX	6670	10185203
Safrole	TX	6685	10185203
Sulfotepp	TX	8155	10185203
Terbufos	TX	8185	10185203
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10185203
Thionazin (Zinophos)	TX	8235	10185203
Toluene diisocyanate	TX	6775	10185203

Method EPA 8280

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10186808
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10186808
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10186808
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10186808
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10186808
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10186808
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10186808
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10186808

Texas Commission on Environmental Quality

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Matrix: ***Solid & Chemical Materials***

1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10186808
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10186808
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10186808
1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10186808
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10186808
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10186808
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10186808
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10186808
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10186808
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10186808
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10186808
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10186808
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10186808
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10186808
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10186808
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10186808
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10186808

Method EPA 8290

Analyte	AB	Analyte ID	Method ID
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	TX	9516	10187209
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	TX	9519	10187209
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	TX	9420	10187209
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	TX	9426	10187209
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	TX	9423	10187209
1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	TX	9471	10187209
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	TX	9453	10187209
1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	TX	9474	10187209
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin(1,2,3,6,7,8-HxCDD)	TX	9456	10187209
1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	TX	9477	10187209
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	TX	9459	10187209

1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	TX	9543	10187209
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	TX	9540	10187209
2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	TX	9480	10187209
2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF	TX	9549	10187209
2,3,7,8-Tetrachlorodibenzofuran (2,3,7,8-TCDF)	TX	9612	10187209
2,3,7,8-Tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD)	TX	9618	10187209
Total Heptachlorodibenzofuran (Total HpCDF)	TX	9444	10187209
Total Heptachlorodibenzo-p-dioxin (Total HpCDD)	TX	9438	10187209
Total Hexachlorodibenzofuran (Total HxCDF)	TX	9483	10187209
Total Hexachlorodibenzo-p-dioxin (Total HxCDD)	TX	9468	10187209
Total Pentachlorodibenzofuran (Total PeCDF)	TX	9552	10187209
Total Pentachlorodibenzo-p-dioxin (Total PeCDD)	TX	9555	10187209
Total Tetrachlorodibenzofuran (Total TCDF)	TX	9615	10187209
Total Tetrachlorodibenzo-p-dioxin (Total TCDD)	TX	9609	10187209

Method EPA 8315

Analyte	**AB**	**Analyte ID**	**Method ID**
Formaldehyde	TX	4815	10187801

Method EPA 8316

Analyte	**AB**	**Analyte ID**	**Method ID**
Acrylamide	TX	4330	10188202

Method EPA 8330

Analyte	**AB**	**Analyte ID**	**Method ID**
1,3,5-Trinitrobenzene (1,3,5-TNB)	TX	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	TX	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	TX	9303	10189807
2-Nitrotoluene	TX	9507	10189807
3-Nitrotoluene	TX	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	TX	9306	10189807

4-Nitrotoluene	TX	9513	10189807
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	TX	6415	10189807
Nitrobenzene	TX	5015	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	TX	9522	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	TX	9432	10189807

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9038

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10196608

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10197203
pH	TX	1900	10196802

Method EPA 9045

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10197805
pH	TX	1900	10197805

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209

Certificate:	**T104704231-18-22**
Expiration Date:	**4/30/2019**
Issue Date:	**8/3/2018**

ALS Laboratory Group, Environmental Services Division (Houston, Texas)

10450 Stancliff Road, Suite 210
Houston, TX 77099-4338

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Solid & Chemical Materials***

Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10200201

Method EPA 9065

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10200405

Method EPA 9071

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10201204

Method EPA 9095

Analyte	**AB**	**Analyte ID**	**Method ID**
Paint Filter Liquids Test	TX	10312	10204009

Method EPA 9250

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	10207202

Method SM 2320 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2510 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	20048004

Method SM 2540 G

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	TX	1950	20005203

Method SSA/ASA Part 3:34

Analyte	**AB**	**Analyte ID**	**Method ID**
Carbon, organic (Walkley-Black)	TX	10340	SSA/ASA Pt 3:34

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate:	**T104704240-18-13**
Expiration Date:	**4/30/2019**
Issue Date:	**5/1/2018**

Armstrong Forensic Laboratory, Inc.

330 Loch'n Green Trail
Arlington, TX 76012-3458

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 4500-Cl G

Analyte	**AB**	**Analyte ID**	**Method ID**
Total residual chlorine	TX	1940	20020604

Method SM 4500-CN$^-$ C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20020808

Method SM 4500-CN$^-$ E

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20021209

Method SM 4500-H+ B

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	20104603

Method SM 4500-NH3 F

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	20023001

Method SM 5210 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5220 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	20027809

Method SM 9222 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total coliforms (enumeration)	TX	2500	20198009

Method SM 9222 B / 9222 G

Analyte	**AB**	**Analyte ID**	**Method ID**
Escherichia coli (enumeration)	TX	2525	20201201

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704407-19-12
Effective Date: 10/1/2019
Expiration Date: 9/30/2020

Executive Director Texas Commission on Environmental Quality

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate:	**T104704407-19-12**
Expiration Date:	**9/30/2020**
Issue Date:	**10/1/2019**

Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Method EPA 1010

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	KS	1780	10116606

Method EPA 120.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	KS	1610	10006403

Method EPA 1311

Analyte	**AB**	**Analyte ID**	**Method ID**
TCLP	KS	849	10118806

Method EPA 1312

Analyte	**AB**	**Analyte ID**	**Method ID**
SPLP	KS	850	10119003

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	KS	1803	10127807
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	KS	10220	10127807

Method EPA 180.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	KS	2055	10011606

Method EPA 200.7

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	KS	1000	10013806
Antimony	KS	1005	10013806
Arsenic	KS	1010	10013806
Barium	KS	1015	10013806
Beryllium	KS	1020	10013806
Boron	KS	1025	10013806
Cadmium	KS	1030	10013806
Calcium	KS	1035	10013806
Chromium	KS	1040	10013806
Cobalt	KS	1050	10013806

Certificate: T104704407-19-12

Pace Analytical Services, LLC - Lenexa KS

Expiration Date: 9/30/2020

Issue Date: 10/1/2019

9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: *Non-Potable Water*

Copper	KS	1055	10013806
Iron	KS	1070	10013806
Lead	KS	1075	10013806
Magnesium	KS	1085	10013806
Manganese	KS	1090	10013806
Molybdenum	KS	1100	10013806
Nickel	KS	1105	10013806
Potassium	KS	1125	10013806
Selenium	KS	1140	10013806
Silver	KS	1150	10013806
Sodium	KS	1155	10013806
Thallium	KS	1165	10013806
Tin	KS	1175	10013806
Vanadium	KS	1185	10013806
Zinc	KS	1190	10013806

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Aluminum	LA-DEQ	1000	10014605
Antimony	LA-DEQ	1005	10014605
Arsenic	LA-DEQ	1010	10014605
Barium	LA-DEQ	1015	10014605
Beryllium	LA-DEQ	1020	10014605
Cadmium	LA-DEQ	1030	10014605
Chromium	LA-DEQ	1040	10014605
Cobalt	LA-DEQ	1050	10014605
Copper	LA-DEQ	1055	10014605
Iron	LA-DEQ	1070	10014605
Lead	LA-DEQ	1075	10014605
Manganese	LA-DEQ	1090	10014605
Molybdenum	LA-DEQ	1100	10014605

Certificate: T104704407-19-12
Expiration Date: 9/30/2020
Issue Date: 10/1/2019

Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: ***Non-Potable Water***

Nickel	LA-DEQ	1105	10014605
Selenium	LA-DEQ	1140	10014605
Silver	LA-DEQ	1150	10014605
Thallium	LA-DEQ	1165	10014605
Vanadium	LA-DEQ	1185	10014605
Zinc	LA-DEQ	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	KS	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	KS	1540	10053200
Chloride	KS	1575	10053200
Fluoride	KS	1730	10053200
Nitrate as N	KS	1810	10053200
Nitrite as N	KS	1840	10053200
Sulfate	KS	2000	10053200

Method EPA 350.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	KS	1515	10063408

Method EPA 351.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	KS	1790	10065404

Method EPA 353.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrate as N	KS	1810	10067400
Nitrate-nitrite	KS	1820	10067400
Nitrite as N	KS	1840	10067400

Method EPA 365.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	KS	1870	10070005

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: ***Non-Potable Water***

Method EPA 365.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Phosphorus	KS	1910	10071202

Method EPA 410.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	KS	1565	10077404

Method EPA 420.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	KS	1905	10079400

Method EPA 420.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	LA-DEQ	1905	10080203

Method EPA 6010

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	KS	1000	10155201
Antimony	KS	1005	10155201
Arsenic	KS	1010	10155201
Barium	KS	1015	10155201
Beryllium	KS	1020	10155201
Boron	KS	1025	10155201
Cadmium	KS	1030	10155201
Calcium	KS	1035	10155201
Chromium	KS	1040	10155201
Cobalt	KS	1050	10155201
Copper	KS	1055	10155201
Iron	KS	1070	10155201
Lead	KS	1075	10155201
Lithium	LA-DEQ	1080	10155201
Magnesium	KS	1085	10155201
Manganese	KS	1090	10155201
Molybdenum	KS	1100	10155201

Matrix: ***Non-Potable Water***

Nickel	KS	1105	10155201
Potassium	KS	1125	10155201
Selenium	KS	1140	10155201
Silica as SiO2	LA-DEQ	1990	10155201
Silver	KS	1150	10155201
Sodium	KS	1155	10155201
Strontium	KS	1160	10155201
Thallium	KS	1165	10155201
Tin	KS	1175	10155201
Titanium	KS	1180	10155201
Vanadium	KS	1185	10155201
Zinc	KS	1190	10155201

Method EPA 6020

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	KS	1000	10156204
Antimony	KS	1005	10156204
Arsenic	KS	1010	10156204
Barium	KS	1015	10156204
Beryllium	KS	1020	10156204
Cadmium	KS	1030	10156204
Chromium	KS	1040	10156204
Cobalt	KS	1050	10156204
Copper	KS	1055	10156204
Iron	KS	1070	10156204
Lead	KS	1075	10156204
Manganese	KS	1090	10156204
Nickel	KS	1105	10156204
Selenium	KS	1140	10156204
Silver	KS	1150	10156204
Strontium	LA-DEQ	1160	10156204

Certificate: T104704407-19-12

Pace Analytical Services, LLC - Lenexa KS

Expiration Date: 9/30/2020

9608 Loiret Boulevard
Lenexa, KS 66219-2406

Issue Date: 10/1/2019

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Matrix: ***Non-Potable Water***

Thallium	KS	1165	10156204
Tin	LA-DEQ	1175	10156204
Titanium	LA-DEQ	1180	10156204
Vanadium	KS	1185	10156204
Zinc	KS	1190	10156204

Method EPA 608.3

Analyte	**AB**	**Analyte ID**	**Method ID**
alpha-BHC (alpha-Hexachlorocyclohexane)	LA-DEQ	7110	10296625
Aroclor-1016 (PCB-1016)	LA-DEQ	8880	10296625
Aroclor-1221 (PCB-1221)	LA-DEQ	8885	10296625
Aroclor-1232 (PCB-1232)	LA-DEQ	8890	10296625
Aroclor-1242 (PCB-1242)	LA-DEQ	8895	10296625
Aroclor-1248 (PCB-1248)	LA-DEQ	8900	10296625
Aroclor-1254 (PCB-1254)	LA-DEQ	8905	10296625
Aroclor-1260 (PCB-1260)	LA-DEQ	8910	10296625
beta-BHC (beta-Hexachlorocyclohexane)	LA-DEQ	7115	10296625
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	LA-DEQ	7120	10296625

Method EPA 624.1

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1-Trichloroethane	LA-DEQ	5160	10298121
1,1,2,2-Tetrachloroethane	LA-DEQ	5110	10298121
1,1,2-Trichloroethane	LA-DEQ	5165	10298121
1,1-Dichloroethane	LA-DEQ	4630	10298121
1,1-Dichloroethylene	LA-DEQ	4640	10298121
1,2-Dibromoethane (EDB, Ethylene dibromide)	LA-DEQ	4585	10298121
1,2-Dichlorobenzene	LA-DEQ	4610	10298121
1,2-Dichloroethane (Ethylene dichloride)	LA-DEQ	4635	10298121
1,2-Dichloropropane	LA-DEQ	4655	10298121
1,3-Dichlorobenzene	LA-DEQ	4615	10298121
1,4-Dichlorobenzene	LA-DEQ	4620	10298121
2-Butanone (Methyl ethyl ketone, MEK)	LA-DEQ	4410	10298121

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate:	**T104704407-19-12**
Expiration Date:	**9/30/2020**
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Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: ***Non-Potable Water***

2-Chloroethyl vinyl ether	LA-DEQ	4500	10298121
Acetone (2-Propanone)	LA-DEQ	4315	10298121
Acrolein (Propenal)	LA-DEQ	4325	10298121
Acrylonitrile	LA-DEQ	4340	10298121
Benzene	LA-DEQ	4375	10298121
Bromodichloromethane	LA-DEQ	4395	10298121
Bromoform	LA-DEQ	4400	10298121
Carbon tetrachloride	LA-DEQ	4455	10298121
Chlorobenzene	LA-DEQ	4475	10298121
Chlorodibromomethane	LA-DEQ	4575	10298121
Chloroethane (Ethyl chloride)	LA-DEQ	4485	10298121
Chloroform	LA-DEQ	4505	10298121
cis-1,2-Dichloroethylene	LA-DEQ	4645	10298121
cis-1,3-Dichloropropene	LA-DEQ	4680	10298121
Ethylbenzene	LA-DEQ	4765	10298121
m+p-xylene	LA-DEQ	5240	10298121
Methyl bromide (Bromomethane)	LA-DEQ	4950	10298121
Methyl chloride (Chloromethane)	LA-DEQ	4960	10298121
Methyl tert-butyl ether (MTBE)	LA-DEQ	5000	10298121
Methylene chloride (Dichloromethane)	LA-DEQ	4975	10298121
Naphthalene	LA-DEQ	5005	10298121
o-Xylene	LA-DEQ	5250	10298121
Tetrachloroethylene (Perchloroethylene)	LA-DEQ	5115	10298121
Toluene	LA-DEQ	5140	10298121
trans-1,2-Dichloroethylene	LA-DEQ	4700	10298121
trans-1,3-Dichloropropylene	LA-DEQ	4685	10298121
Trichloroethene (Trichloroethylene)	LA-DEQ	5170	10298121
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	LA-DEQ	5175	10298121
Vinyl chloride	LA-DEQ	5235	10298121
Xylene (total)	LA-DEQ	5260	10298121

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704407-19-12
Expiration Date: 9/30/2020
Issue Date: 10/1/2019

Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Method EPA 625.1

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	LA-DEQ	6715	10300024
1,2,4-Trichlorobenzene	LA-DEQ	5155	10300024
1,2-Dichlorobenzene	LA-DEQ	4610	10300024
1,2-Diphenylhydrazine	LA-DEQ	6221	10300024
1,3-Dichlorobenzene	LA-DEQ	4615	10300024
1,4-Dichlorobenzene	LA-DEQ	4620	10300024
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	LA-DEQ	4659	10300024
2,3,4,6-Tetrachlorophenol	LA-DEQ	6735	10300024
2,4,5-Trichlorophenol	LA-DEQ	6835	10300024
2,4,6-Trichlorophenol	LA-DEQ	6840	10300024
2,4-Dichlorophenol	LA-DEQ	6000	10300024
2,4-Dimethylphenol	LA-DEQ	6130	10300024
2,4-Dinitrophenol	LA-DEQ	6175	10300024
2,4-Dinitrotoluene (2,4-DNT)	LA-DEQ	6185	10300024
2,6-Dinitrotoluene (2,6-DNT)	LA-DEQ	6190	10300024
2-Chlorophenol	LA-DEQ	5800	10300024
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	LA-DEQ	6360	10300024
2-Methylphenol (o-Cresol)	LA-DEQ	6400	10300024
2-Nitrophenol	LA-DEQ	6490	10300024
3,3'-Dichlorobenzidine	LA-DEQ	5945	10300024
4-Bromophenyl phenyl ether (BDE-3)	LA-DEQ	5660	10300024
4-Chloro-3-methylphenol	LA-DEQ	5700	10300024
4-Chlorophenyl phenylether	LA-DEQ	5825	10300024
4-Methylphenol (p-Cresol)	LA-DEQ	6410	10300024
4-Nitrophenol	LA-DEQ	6500	10300024
Acenaphthene	LA-DEQ	5500	10300024
Acenaphthylene	LA-DEQ	5505	10300024
Anthracene	LA-DEQ	5555	10300024

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

	Certificate:	**T104704407-19-12**
Pace Analytical Services, LLC - Lenexa KS	**Expiration Date:**	**9/30/2020**
	Issue Date:	**10/1/2019**

9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: ***Non-Potable Water***

Benzidine	LA-DEQ	5595	10300024
Benzo(a)anthracene	LA-DEQ	5575	10300024
Benzo(a)pyrene	LA-DEQ	5580	10300024
Benzo(b)fluoranthene	LA-DEQ	5585	10300024
Benzo(g,h,i)perylene	LA-DEQ	5590	10300024
Benzo(k)fluoranthene	LA-DEQ	5600	10300024
bis(2-Chloroethoxy)methane	LA-DEQ	5760	10300024
bis(2-Chloroethyl) ether	LA-DEQ	5765	10300024
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	LA-DEQ	6065	10300024
Chrysene	LA-DEQ	5855	10300024
Dibenz(a,h) anthracene	LA-DEQ	5895	10300024
Diethyl phthalate	LA-DEQ	6070	10300024
Dimethyl phthalate	LA-DEQ	6135	10300024
Di-n-butyl phthalate	LA-DEQ	5925	10300024
Di-n-octyl phthalate	LA-DEQ	6200	10300024
Fluoranthene	LA-DEQ	6265	10300024
Fluorene	LA-DEQ	6270	10300024
Hexachlorobenzene	LA-DEQ	6275	10300024
Hexachlorobutadiene	LA-DEQ	4835	10300024
Hexachlorocyclopentadiene	LA-DEQ	6285	10300024
Hexachloroethane	LA-DEQ	4840	10300024
Indeno(1,2,3-cd) pyrene	LA-DEQ	6315	10300024
Isophorone	LA-DEQ	6320	10300024
Naphthalene	LA-DEQ	5005	10300024
Nitrobenzene	LA-DEQ	5015	10300024
n-Nitrosodimethylamine	LA-DEQ	6530	10300024
n-Nitrosodi-n-butylamine	LA-DEQ	5025	10300024
n-Nitrosodi-n-propylamine	LA-DEQ	6545	10300024
n-Nitrosodiphenylamine	LA-DEQ	6535	10300024
Pentachlorophenol	LA-DEQ	6605	10300024

Certificate: T104704407-19-12

Pace Analytical Services, LLC - Lenexa KS

Expiration Date: 9/30/2020

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Lenexa, KS 66219-2406

Issue Date: 10/1/2019

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Matrix: ***Non-Potable Water***

Phenanthrene	LA-DEQ	6615	10300024
Phenol	LA-DEQ	6625	10300024
Pyrene	LA-DEQ	6665	10300024
Pyridine	LA-DEQ	5095	10300024

Method EPA 7196

Analyte	AB	Analyte ID	Method ID
Chromium (VI)	KS	1045	10162206

Method EPA 7470

Analyte	AB	Analyte ID	Method ID
Mercury	KS	1095	10165603

Method EPA 7471

Analyte	AB	Analyte ID	Method ID
Mercury	KS	1095	10166004

Method EPA 8011

Analyte	AB	Analyte ID	Method ID
1,2-Dibromo-3-chloropropane (DBCP)	KS	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	KS	4585	10173009

Method EPA 8015

Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	KS	9369	10173203
Gasoline range organics (GRO)	KS	9408	10173203

Method EPA 8082

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	KS	8880	10179007
Aroclor-1221 (PCB-1221)	KS	8885	10179007
Aroclor-1232 (PCB-1232)	KS	8890	10179007
Aroclor-1242 (PCB-1242)	KS	8895	10179007
Aroclor-1248 (PCB-1248)	KS	8900	10179007
Aroclor-1254 (PCB-1254)	KS	8905	10179007
Aroclor-1260 (PCB-1260)	KS	8910	10179007

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: ***Non-Potable Water***

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	KS	5105	10184404
1,1,1-Trichloroethane	KS	5160	10184404
1,1,2,2-Tetrachloroethane	KS	5110	10184404
1,1,2-Trichloroethane	KS	5165	10184404
1,1-Dichloroethane	KS	4630	10184404
1,1-Dichloroethylene	KS	4640	10184404
1,1-Dichloropropene	KS	4670	10184404
1,2,3-Trichlorobenzene	KS	5150	10184404
1,2,3-Trichloropropane	KS	5180	10184404
1,2,4-Trichlorobenzene	KS	5155	10184404
1,2,4-Trimethylbenzene	KS	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	KS	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	KS	4585	10184404
1,2-Dichlorobenzene	KS	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	KS	4635	10184404
1,2-Dichloropropane	KS	4655	10184404
1,3,5-Trimethylbenzene	KS	5215	10184404
1,3-Dichlorobenzene	KS	4615	10184404
1,3-Dichloropropane	KS	4660	10184404
1,4-Dichlorobenzene	KS	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	KS	4735	10184404
2,2-Dichloropropane	KS	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	KS	4410	10184404
2-Chloroethyl vinyl ether	KS	4500	10184404
2-Chlorotoluene	KS	4535	10184404
2-Hexanone (MBK)	KS	4860	10184404
4-Chlorotoluene	KS	4540	10184404
4-Isopropyltoluene (p-Cymene)	KS	4915	10184404

Certificate: T104704407-19-12

Pace Analytical Services, LLC - Lenexa KS

Expiration Date: 9/30/2020

9608 Loiret Boulevard
Lenexa, KS 66219-2406

Issue Date: 10/1/2019

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Matrix: ***Non-Potable Water***

4-Methyl-2-pentanone (MIBK)	KS	4995	10184404
Acetone (2-Propanone)	KS	4315	10184404
Acetonitrile	KS	4320	10184404
Acrolein (Propenal)	KS	4325	10184404
Acrylonitrile	KS	4340	10184404
Benzene	KS	4375	10184404
Bromobenzene	KS	4385	10184404
Bromochloromethane	KS	4390	10184404
Bromodichloromethane	KS	4395	10184404
Bromoform	KS	4400	10184404
Carbon disulfide	KS	4450	10184404
Carbon tetrachloride	KS	4455	10184404
Chlorobenzene	KS	4475	10184404
Chlorodibromomethane	KS	4575	10184404
Chloroethane (Ethyl chloride)	KS	4485	10184404
Chloroform	KS	4505	10184404
cis-1,2-Dichloroethylene	KS	4645	10184404
cis-1,3-Dichloropropene	KS	4680	10184404
Dibromochloropropane	LA-DEQ	4580	10184404
Dibromomethane (Methylene bromide)	KS	4595	10184404
Dichlorodifluoromethane (Freon-12)	KS	4625	10184404
Diethyl ether	LA-DEQ	4725	10184404
Di-isopropylether (DIPE)	LA-DEQ	9375	10184404
Ethylbenzene	KS	4765	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	LA-DEQ	4770	10184404
Hexachlorobutadiene	KS	4835	10184404
Iodomethane (Methyl iodide)	KS	4870	10184404
Isopropylbenzene (Cumene)	KS	4900	10184404
m+p-xylene	KS	5240	10184404
Methyl bromide (Bromomethane)	KS	4950	10184404

Matrix: ***Non-Potable Water***

Methyl chloride (Chloromethane)	KS	4960	10184404
Methyl tert-butyl ether (MTBE)	KS	5000	10184404
Methylene chloride (Dichloromethane)	KS	4975	10184404
Naphthalene	KS	5005	10184404
n-Butylbenzene	KS	4435	10184404
n-Propylbenzene	KS	5090	10184404
o-Xylene	KS	5250	10184404
sec-Butylbenzene	KS	4440	10184404
Styrene	KS	5100	10184404
T-amylmethylether (TAME)	LA-DEQ	4370	10184404
tert-Butyl alcohol	KS	4420	10184404
tert-Butylbenzene	KS	4445	10184404
Tetrachloroethylene (Perchloroethylene)	KS	5115	10184404
Toluene	KS	5140	10184404
trans-1,2-Dichloroethylene	KS	4700	10184404
trans-1,3-Dichloropropylene	KS	4685	10184404
trans-1,4-Dichloro-2-butene	KS	4605	10184404
Trichloroethene (Trichloroethylene)	KS	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	KS	5175	10184404
Vinyl acetate	KS	5225	10184404
Vinyl chloride	KS	5235	10184404
Xylene (total)	KS	5260	10184404

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	LA-DEQ	6715	10185203
1,2,4-Trichlorobenzene	KS	5155	10185203
1,2-Dichlorobenzene	KS	4610	10185203
1,2-Diphenylhydrazine	KS	6220	10185203
1,3-Dichlorobenzene	KS	4615	10185203
1,4-Dichlorobenzene	KS	4620	10185203

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: ***Non-Potable Water***

2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	KS	4659	10185203
2,3,4,6-Tetrachlorophenol	LA-DEQ	6735	10185203
2,4,5-Trichlorophenol	KS	6835	10185203
2,4,6-Trichlorophenol	KS	6840	10185203
2,4-Dichlorophenol	KS	6000	10185203
2,4-Dimethylphenol	KS	6130	10185203
2,4-Dinitrophenol	KS	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	KS	6185	10185203
2,6-Dichlorophenol	LA-DEQ	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	KS	6190	10185203
2-Chlorophenol	KS	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	KS	6360	10185203
2-Methylnaphthalene	KS	6385	10185203
2-Methylphenol (o-Cresol)	KS	6400	10185203
2-Nitroaniline	KS	6460	10185203
2-Nitrophenol	KS	6490	10185203
3,3'-Dichlorobenzidine	KS	5945	10185203
3-Methylphenol (m-Cresol)	KS	6405	10185203
3-Nitroaniline	KS	6465	10185203
4-Bromophenyl phenyl ether (BDE-3)	KS	5660	10185203
4-Chloro-3-methylphenol	KS	5700	10185203
4-Chloroaniline	KS	5745	10185203
4-Chlorophenyl phenylether	KS	5825	10185203
4-Methylphenol (p-Cresol)	KS	6410	10185203
4-Nitroaniline	KS	6470	10185203
4-Nitrophenol	KS	6500	10185203
7,12-Dimethylbenz(a) anthracene	KS	6115	10185203
Acenaphthene	KS	5500	10185203
Acenaphthylene	KS	5505	10185203
Aniline	KS	5545	10185203

Certificate: T104704407-19-12

Pace Analytical Services, LLC - Lenexa KS

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Lenexa, KS 66219-2406

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Matrix: ***Non-Potable Water***

Anthracene	KS	5555	10185203
Azobenzene	LA-DEQ	5562	10185203
Benzenethiol (Thiophenol)	KS	6750	10185203
Benzidine	KS	5595	10185203
Benzo(a)anthracene	KS	5575	10185203
Benzo(a)pyrene	KS	5580	10185203
Benzo(b)fluoranthene	KS	5585	10185203
Benzo(g,h,i)perylene	KS	5590	10185203
Benzo(k)fluoranthene	KS	5600	10185203
Benzoic acid	KS	5610	10185203
Benzyl alcohol	KS	5630	10185203
bis(2-Chloroethoxy)methane	KS	5760	10185203
bis(2-Chloroethyl) ether	KS	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	KS	6065	10185203
Butyl benzyl phthalate	KS	5670	10185203
Carbazole	LA-DEQ	5680	10185203
Chrysene	KS	5855	10185203
Dibenz(a,h) anthracene	KS	5895	10185203
Dibenz(a,j) acridine	KS	5900	10185203
Dibenzofuran	KS	5905	10185203
Diethyl phthalate	KS	6070	10185203
Dimethyl phthalate	KS	6135	10185203
Di-n-butyl phthalate	KS	5925	10185203
Di-n-octyl phthalate	KS	6200	10185203
Fluoranthene	KS	6265	10185203
Fluorene	KS	6270	10185203
Hexachlorobenzene	KS	6275	10185203
Hexachlorobutadiene	KS	4835	10185203
Hexachlorocyclopentadiene	KS	6285	10185203
Hexachloroethane	KS	4840	10185203

Matrix: ***Non-Potable Water***

Indeno(1,2,3-cd) pyrene	KS	6315	10185203
Isophorone	KS	6320	10185203
Naphthalene	KS	5005	10185203
Nitrobenzene	KS	5015	10185203
n-Nitrosodimethylamine	KS	6530	10185203
n-Nitrosodi-n-butylamine	KS	5025	10185203
n-Nitrosodi-n-propylamine	KS	6545	10185203
n-Nitrosodiphenylamine	KS	6535	10185203
n-Nitrosomethylethylamine	KS	6550	10185203
Pentachlorophenol	KS	6605	10185203
Phenanthrene	KS	6615	10185203
Phenol	KS	6625	10185203
Pyrene	KS	6665	10185203
Pyridine	KS	5095	10185203
Quinoline	LA-DEQ	6670	10185203

Method EPA 9012

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	KS	1510	10193201
Total cyanide	KS	1645	10193201

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	KS	1900	10196802

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	KS	1610	10198604

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	KS	1540	10199209
Chloride	KS	1575	10199209
Fluoride	KS	1730	10199209
Nitrate as N	KS	1810	10199209

Texas Commission on Environmental Quality

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Pace Analytical Services, LLC - Lenexa KS

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Matrix: ***Non-Potable Water***

Nitrate-nitrite	KS	1820	10199209
Nitrite as N	KS	1840	10199209
Sulfate	KS	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	KS	2040	10200201

Method EPA 9066

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	KS	1905	10200609

Method EPA 9070

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	KS	1803	10201000
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	KS	10220	10201000

Method SM 2120 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Color	KS	1605	20223807

Method SM 2320 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	KS	1505	20045005

Method SM 2340 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total hardness as CaCO3	KS	1755	20046008

Method SM 2540 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	KS	1950	20004608

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	KS	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	KS	1960	20004802

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Pace Analytical Services, LLC - Lenexa KS

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Matrix: ***Non-Potable Water***

Method SM 2540 F

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-settleable	KS	1965	20005009

Method SM 3500-Cr B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	KS	1045	20065809

Method SM 3500-Fe B

Analyte	**AB**	**Analyte ID**	**Method ID**
Iron	KS	1070	20068604

Method SM 4500-Cl G

Analyte	**AB**	**Analyte ID**	**Method ID**
Total residual chlorine	KS	1940	20020604

Method SM 4500-Cl^{-} E

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	KS	1575	20019209

Method SM 4500-CN^{-} E

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	KS	1645	20021209

Method SM 4500-CN^{-} G

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	KS	1510	20021607

Method SM 4500-H+ B

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	KS	1900	20104603

Method SM 4500-O G

Analyte	**AB**	**Analyte ID**	**Method ID**
Oxygen, dissolved	KS	1880	20025405

Method SM 4500-$S2^{-}$ D

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	LA-DEQ	2005	20125400

Method SM 4500-$S2^{-}$ F

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

Sulfide	KS	2005	20126209

Method SM 4500-SO3^{-} B

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfite	KS	2015	20026806

Method SM 5210 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Biochemical oxygen demand (BOD)	KS	1530	20027401
Carbonaceous BOD, CBOD	KS	1555	20027401

Method SM 5310 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	KS	2040	20138209

Method SM 5540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Surfactants - MBAS	KS	2025	20144405

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

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Matrix: ***Solid & Chemical Materials***

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	KS	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	KS	850	10119003

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	KS	1000	10155201
Antimony	KS	1005	10155201
Arsenic	KS	1010	10155201
Barium	KS	1015	10155201
Beryllium	KS	1020	10155201
Boron	KS	1025	10155201
Cadmium	KS	1030	10155201
Calcium	KS	1035	10155201
Chromium	KS	1040	10155201
Cobalt	KS	1050	10155201
Copper	KS	1055	10155201
Iron	KS	1070	10155201
Lead	KS	1075	10155201
Magnesium	KS	1085	10155201
Manganese	KS	1090	10155201
Molybdenum	KS	1100	10155201
Nickel	KS	1105	10155201
Potassium	KS	1125	10155201
Selenium	KS	1140	10155201
Silica as SiO2	LA-DEQ	1990	10155201
Silver	KS	1150	10155201
Sodium	KS	1155	10155201
Strontium	KS	1160	10155201

Matrix: ***Solid & Chemical Materials***

Thallium	KS	1165	10155201
Tin	KS	1175	10155201
Titanium	KS	1180	10155201
Vanadium	KS	1185	10155201
Zinc	KS	1190	10155201

Method EPA 6020

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	LA-DEQ	1000	10156204
Antimony	LA-DEQ	1005	10156204
Arsenic	KS	1010	10156204
Barium	LA-DEQ	1015	10156204
Beryllium	LA-DEQ	1020	10156204
Cadmium	KS	1030	10156204
Chromium	KS	1040	10156204
Cobalt	LA-DEQ	1050	10156204
Copper	KS	1055	10156204
Iron	LA-DEQ	1070	10156204
Lead	KS	1075	10156204
Manganese	LA-DEQ	1090	10156204
Molybdenum	KS	1100	10156204
Nickel	KS	1105	10156204
Selenium	KS	1140	10156204
Silver	LA-DEQ	1150	10156204
Strontium	KS	1160	10156204
Thallium	LA-DEQ	1165	10156204
Tin	KS	1175	10156204
Titanium	KS	1180	10156204
Vanadium	LA-DEQ	1185	10156204
Zinc	KS	1190	10156204

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**

Certificate:	T104704407-19-12
Expiration Date:	9/30/2020
Issue Date:	10/1/2019

Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: ***Solid & Chemical Materials***

Mercury	KS	1095	10165603

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	KS	1095	10166004

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	KS	9369	10173203
Gasoline range organics (GRO)	KS	9408	10173203

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	KS	8880	10179007
Aroclor-1221 (PCB-1221)	KS	8885	10179007
Aroclor-1232 (PCB-1232)	KS	8890	10179007
Aroclor-1242 (PCB-1242)	KS	8895	10179007
Aroclor-1248 (PCB-1248)	KS	8900	10179007
Aroclor-1254 (PCB-1254)	KS	8905	10179007
Aroclor-1260 (PCB-1260)	KS	8910	10179007

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	KS	5105	10184404
1,1,1-Trichloroethane	KS	5160	10184404
1,1,2,2-Tetrachloroethane	KS	5110	10184404
1,1,2-Trichloroethane	KS	5165	10184404
1,1-Dichloroethane	KS	4630	10184404
1,1-Dichloroethylene	KS	4640	10184404
1,1-Dichloropropene	KS	4670	10184404
1,2,3-Trichlorobenzene	KS	5150	10184404
1,2,3-Trichloropropane	KS	5180	10184404
1,2,4-Trichlorobenzene	KS	5155	10184404
1,2,4-Trimethylbenzene	KS	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	KS	4570	10184404

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704407-19-12
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Matrix: ***Solid & Chemical Materials***

1,2-Dibromoethane (EDB, Ethylene dibromide)	KS	4585	10184404
1,2-Dichlorobenzene	KS	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	KS	4635	10184404
1,2-Dichloropropane	KS	4655	10184404
1,3,5-Trimethylbenzene	KS	5215	10184404
1,3-Dichlorobenzene	KS	4615	10184404
1,3-Dichloropropane	KS	4660	10184404
1,4-Dichlorobenzene	KS	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	KS	4735	10184404
2-Butanone (Methyl ethyl ketone, MEK)	KS	4410	10184404
2-Chloroethyl vinyl ether	KS	4500	10184404
2-Chlorotoluene	KS	4535	10184404
2-Hexanone (MBK)	KS	4860	10184404
4-Chlorotoluene	KS	4540	10184404
4-Isopropyltoluene (p-Cymene)	KS	4915	10184404
4-Methyl-2-pentanone (MIBK)	KS	4995	10184404
Acetone (2-Propanone)	KS	4315	10184404
Acetonitrile	KS	4320	10184404
Acrolein (Propenal)	KS	4325	10184404
Acrylonitrile	KS	4340	10184404
Benzene	KS	4375	10184404
Bromobenzene	KS	4385	10184404
Bromochloromethane	KS	4390	10184404
Bromodichloromethane	KS	4395	10184404
Bromoform	KS	4400	10184404
Carbon disulfide	KS	4450	10184404
Carbon tetrachloride	KS	4455	10184404
Chlorobenzene	KS	4475	10184404
Chlorodibromomethane	KS	4575	10184404
Chloroethane (Ethyl chloride)	KS	4485	10184404

Texas Commission on Environmental Quality

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Pace Analytical Services, LLC - Lenexa KS

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Lenexa, KS 66219-2406

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Matrix: ***Solid & Chemical Materials***

Chloroform	KS	4505	10184404
cis-1,2-Dichloroethylene	KS	4645	10184404
cis-1,3-Dichloropropene	KS	4680	10184404
Dibromomethane (Methylene bromide)	KS	4595	10184404
Dichlorodifluoromethane (Freon-12)	KS	4625	10184404
Ethylbenzene	KS	4765	10184404
Hexachlorobutadiene	KS	4835	10184404
Iodomethane (Methyl iodide)	KS	4870	10184404
Isopropylbenzene (Cumene)	KS	4900	10184404
m+p-xylene	KS	5240	10184404
Methyl bromide (Bromomethane)	KS	4950	10184404
Methyl chloride (Chloromethane)	KS	4960	10184404
Methyl tert-butyl ether (MTBE)	KS	5000	10184404
Methylene chloride (Dichloromethane)	KS	4975	10184404
Naphthalene	KS	5005	10184404
n-Butylbenzene	KS	4435	10184404
n-Propylbenzene	KS	5090	10184404
o-Xylene	KS	5250	10184404
sec-Butylbenzene	KS	4440	10184404
Styrene	KS	5100	10184404
tert-Butyl alcohol	KS	4420	10184404
tert-Butylbenzene	KS	4445	10184404
Tetrachloroethylene (Perchloroethylene)	KS	5115	10184404
Toluene	KS	5140	10184404
trans-1,2-Dichloroethylene	KS	4700	10184404
trans-1,3-Dichloropropylene	KS	4685	10184404
trans-1,4-Dichloro-2-butene	KS	4605	10184404
Trichloroethene (Trichloroethylene)	KS	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	KS	5175	10184404
Vinyl acetate	KS	5225	10184404

Certificate: T104704407-19-12
Expiration Date: 9/30/2020
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Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: ***Solid & Chemical Materials***

Vinyl chloride	KS	5235	10184404
Xylene (total)	KS	5260	10184404

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	LA-DEQ	6715	10185203
1,2,4-Trichlorobenzene	KS	5155	10185203
1,2-Dichlorobenzene	KS	4610	10185203
1,2-Diphenylhydrazine	KS	6220	10185203
1,3-Dichlorobenzene	KS	4615	10185203
1,4-Dichlorobenzene	KS	4620	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	KS	4659	10185203
2,3,4,6-Tetrachlorophenol	LA-DEQ	6735	10185203
2,4,5-Trichlorophenol	KS	6835	10185203
2,4,6-Trichlorophenol	KS	6840	10185203
2,4-Dichlorophenol	KS	6000	10185203
2,4-Dimethylphenol	KS	6130	10185203
2,4-Dinitrophenol	KS	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	KS	6185	10185203
2,6-Dichlorophenol	LA-DEQ	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	KS	6190	10185203
2-Chloronaphthalene	KS	5795	10185203
2-Chlorophenol	KS	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	KS	6360	10185203
2-Methylnaphthalene	KS	6385	10185203
2-Methylphenol (o-Cresol)	KS	6400	10185203
2-Nitroaniline	KS	6460	10185203
2-Nitrophenol	KS	6490	10185203
3,3'-Dichlorobenzidine	KS	5945	10185203
3-Methylphenol (m-Cresol)	KS	6405	10185203
3-Nitroaniline	KS	6465	10185203

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: ***Solid & Chemical Materials***

4-Bromophenyl phenyl ether (BDE-3)	KS	5660	10185203
4-Chloro-3-methylphenol	KS	5700	10185203
4-Chloroaniline	KS	5745	10185203
4-Chlorophenyl phenylether	KS	5825	10185203
4-Methylphenol (p-Cresol)	KS	6410	10185203
4-Nitroaniline	KS	6470	10185203
4-Nitrophenol	KS	6500	10185203
7,12-Dimethylbenz(a) anthracene	KS	6115	10185203
Acenaphthene	KS	5500	10185203
Acenaphthylene	KS	5505	10185203
Aniline	KS	5545	10185203
Anthracene	KS	5555	10185203
Azobenzene	LA-DEQ	5562	10185203
Benzenethiol (Thiophenol)	KS	6750	10185203
Benzidine	KS	5595	10185203
Benzo(a)anthracene	KS	5575	10185203
Benzo(a)pyrene	KS	5580	10185203
Benzo(b)fluoranthene	KS	5585	10185203
Benzo(g,h,i)perylene	KS	5590	10185203
Benzo(k)fluoranthene	KS	5600	10185203
Benzoic acid	KS	5610	10185203
Benzyl alcohol	KS	5630	10185203
bis(2-Chloroethoxy)methane	KS	5760	10185203
bis(2-Chloroethyl) ether	KS	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	KS	6065	10185203
Butyl benzyl phthalate	KS	5670	10185203
Carbazole	LA-DEQ	5680	10185203
Chrysene	KS	5855	10185203
Dibenz(a,h) anthracene	KS	5895	10185203
Dibenz(a,j) acridine	KS	5900	10185203

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Pace Analytical Services, LLC - Lenexa KS	**Certificate:**	**T104704407-19-12**
	Expiration Date:	**9/30/2020**
9608 Loiret Boulevard **Lenexa, KS 66219-2406**	**Issue Date:**	**10/1/2019**

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Matrix: ***Solid & Chemical Materials***

Dibenzofuran	KS	5905	10185203
Diethyl phthalate	KS	6070	10185203
Dimethyl phthalate	KS	6135	10185203
Di-n-butyl phthalate	KS	5925	10185203
Di-n-octyl phthalate	KS	6200	10185203
Fluoranthene	KS	6265	10185203
Fluorene	KS	6270	10185203
Hexachlorobenzene	KS	6275	10185203
Hexachlorobutadiene	KS	4835	10185203
Hexachlorocyclopentadiene	KS	6285	10185203
Hexachloroethane	KS	4840	10185203
Indeno(1,2,3-cd) pyrene	KS	6315	10185203
Isophorone	KS	6320	10185203
Naphthalene	KS	5005	10185203
Nitrobenzene	KS	5015	10185203
n-Nitrosodimethylamine	KS	6530	10185203
n-Nitrosodi-n-butylamine	KS	5025	10185203
n-Nitrosodi-n-propylamine	KS	6545	10185203
n-Nitrosodiphenylamine	KS	6535	10185203
n-Nitrosomethylethylamine	KS	6550	10185203
Pentachlorophenol	KS	6605	10185203
Phenanthrene	KS	6615	10185203
Phenol	KS	6625	10185203
Pyrene	KS	6665	10185203
Pyridine	KS	5095	10185203
Quinoline	LA-DEQ	6670	10185203

Method EPA 9012

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	KS	1510	10193201
Total cyanide	KS	1645	10193201

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704407-19-12
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Pace Analytical Services, LLC - Lenexa KS

9608 Loiret Boulevard
Lenexa, KS 66219-2406

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Matrix: ***Solid & Chemical Materials***

Method EPA 9045

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	KS	1900	10197805

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	KS	1540	10199209
Chloride	KS	1575	10199209
Fluoride	KS	1730	10199209
Nitrate as N	KS	1810	10199209
Nitrate-nitrite	KS	1820	10199209
Nitrite as N	KS	1840	10199209
Sulfate	KS	2000	10199209

Method EPA 9066

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	KS	1905	10200609

Method EPA 9071

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	KS	1803	10201204
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	KS	10220	10201204

Method EPA 9081

Analyte	**AB**	**Analyte ID**	**Method ID**
Cation exchange capacity	KS	1560	10203404

Method EPA 9095

Analyte	**AB**	**Analyte ID**	**Method ID**
Paint Filter Liquids Test	KS	10312	10204009

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

Pace Analytical Services, LLC - Dallas, TX

400 West Bethany Drive, Suite 190
Allen, TX 75013-3714

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704232-19-29
Effective Date: 7/25/2019
Expiration Date: 6/30/2020

Executive Director Texas Commission on
Environmental Quality

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704232-19-29
Expiration Date: 6/30/2020
Issue Date: 7/25/2019

Pace Analytical Services, LLC - Dallas, TX

400 West Bethany Drive, Suite 190
Allen, TX 75013-3714

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Matrix: ***Drinking Water***

Method SM 9222 D (MFC Medium)

Analyte	**AB**	**Analyte ID**	**Method ID**
Fecal coliforms (enumeration)	TX	2530	20210008

Method SM 9223-IDEXX Laboratories Colilert® Test

Analyte	**AB**	**Analyte ID**	**Method ID**
Total coliforms and E. coli (P/A)	TX	2502	20212413

Method SM 9223-IDEXX Laboratories Colilert® Quanti-Tray Test

Analyte	**AB**	**Analyte ID**	**Method ID**
Escherichia coli (enumeration)	TX	2525	20211603
Total coliforms (enumeration)	TX	2500	20211603

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Matrix: ***Non-Potable Water***

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 120.1

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	10006403

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 160.4

Analyte	AB	Analyte ID	Method ID
Residue-volatile	TX	1970	10010409

Method EPA 1664

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	TX	10220	10127807

Method EPA 1666

Analyte	AB	Analyte ID	Method ID
Ethyl acetate	TX	4755	10128208
Isopropyl acetate	TX	4890	10128208
n-Amyl acetate	TX	4360	10128208

Method EPA 180.1

Analyte	AB	Analyte ID	Method ID
Turbidity	TX	2055	10011606

Method EPA 200.7

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10013806
Antimony	TX	1005	10013806

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Matrix: ***Non-Potable Water***

Arsenic	TX	1010	10013806
Barium	TX	1015	10013806
Beryllium	TX	1020	10013806
Boron	TX	1025	10013806
Cadmium	TX	1030	10013806
Calcium	TX	1035	10013806
Chromium	TX	1040	10013806
Cobalt	TX	1050	10013806
Copper	TX	1055	10013806
Iron	TX	1070	10013806
Lead	TX	1075	10013806
Magnesium	TX	1085	10013806
Manganese	TX	1090	10013806
Molybdenum	TX	1100	10013806
Nickel	TX	1105	10013806
Potassium	TX	1125	10013806
Selenium	TX	1140	10013806
Silver	TX	1150	10013806
Sodium	TX	1155	10013806
Strontium	TX	1160	10013806
Thallium	TX	1165	10013806
Tin	TX	1175	10013806
Titanium	TX	1180	10013806
Vanadium	TX	1185	10013806
Zinc	TX	1190	10013806

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605

Certificate: T104704232-19-29

Pace Analytical Services, LLC - Dallas, TX

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Issue Date: 7/25/2019

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Matrix: ***Non-Potable Water***

Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Cadmium	TX	1030	10014605
Calcium	TX	1035	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605
Copper	TX	1055	10014605
Iron	TX	1070	10014605
Lead	TX	1075	10014605
Magnesium	TX	1085	10014605
Manganese	TX	1090	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Potassium	TX	1125	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Thallium	TX	1165	10014605
Vanadium	TX	1185	10014605
Zinc	TX	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200

Matrix: ***Non-Potable Water***

Sulfate	TX	2000	10053200

Method EPA 353.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrate as N	TX	1810	10067400
Nitrate-nitrite	TX	1820	10067400
Nitrite as N	TX	1840	10067400

Method EPA 420.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10079400

Method EPA 524.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Acetone (2-Propanone)	TX	4315	10088809
Methylene chloride (Dichloromethane)	TX	4975	10088809

Method EPA 6010

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10155609
Antimony	TX	1005	10155609
Arsenic	TX	1010	10155609
Barium	TX	1015	10155609
Beryllium	TX	1020	10155609
Boron	TX	1025	10155609
Cadmium	TX	1030	10155609
Calcium	TX	1035	10155609
Chromium	TX	1040	10155609
Cobalt	TX	1050	10155609
Copper	TX	1055	10155609
Iron	TX	1070	10155609
Lead	TX	1075	10155609
Magnesium	TX	1085	10155609
Manganese	TX	1090	10155609
Molybdenum	TX	1100	10155609

Matrix: ***Non-Potable Water***

Nickel	TX	1105	10155609
Potassium	TX	1125	10155609
Selenium	TX	1140	10155609
Silver	TX	1150	10155609
Sodium	TX	1155	10155609
Strontium	TX	1160	10155609
Thallium	TX	1165	10155609
Tin	TX	1175	10155609
Titanium	TX	1180	10155609
Vanadium	TX	1185	10155609
Zinc	TX	1190	10155609

Method EPA 6020

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704232-19-29
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Matrix: ***Non-Potable Water***

Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419
Thallium	TX	1165	10156419
Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 608

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603
Aroclor-1248 (PCB-1248)	TX	8900	10103603
Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603

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Matrix: ***Non-Potable Water***

Heptachlor	TX	7685	10103603
Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603
Toxaphene (Chlorinated camphene)	TX	8250	10103603

Method EPA 608.3

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	TX	7355	10296625
4,4'-DDE	TX	7360	10296625
4,4'-DDT	TX	7365	10296625
Aldrin	TX	7025	10296625
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10296625
alpha-Chlordane	TX	7240	10296625
Aroclor-1016 (PCB-1016)	TX	8880	10296625
Aroclor-1221 (PCB-1221)	TX	8885	10296625
Aroclor-1232 (PCB-1232)	TX	8890	10296625
Aroclor-1242 (PCB-1242)	TX	8895	10296625
Aroclor-1248 (PCB-1248)	TX	8900	10296625
Aroclor-1254 (PCB-1254)	TX	8905	10296625
Aroclor-1260 (PCB-1260)	TX	8910	10296625
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10296625
Chlordane (tech.)	TX	7250	10296625
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10296625
Dieldrin	TX	7470	10296625
Endosulfan I	TX	7510	10296625
Endosulfan II	TX	7515	10296625
Endosulfan sulfate	TX	7520	10296625
Endrin	TX	7540	10296625
Endrin aldehyde	TX	7530	10296625
Endrin ketone	TX	7535	10296625
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10296625

Matrix: ***Non-Potable Water***

gamma-Chlordane	TX	7245	10296625
Heptachlor	TX	7685	10296625
Heptachlor epoxide	TX	7690	10296625
Methoxychlor	TX	7810	10296625
Toxaphene (Chlorinated camphene)	TX	8250	10296625

Method EPA 615

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	TX	8655	10298201
2,4-D	TX	8545	10298201
2,4-DB	TX	8560	10298201
Dalapon	TX	8555	10298201
Dicamba	TX	8595	10298201
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10298201
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10298201
MCPA	TX	7775	10298201
MCPP	TX	7780	10298201
Silvex (2,4,5-TP)	TX	8650	10298201

Method EPA 624

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207
1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207

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Matrix: ***Non-Potable Water***

2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207
Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,2-Dichloroethylene	TX	4645	10107207
cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
Naphthalene	TX	5005	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
Total trihalomethanes	TX	5205	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207
Vinyl chloride	TX	5235	10107207

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Matrix: ***Non-Potable Water***

Xylene (total)	TX	5260	10107207

Method EPA 624.1

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	TX	5160	10298121
1,1,2,2-Tetrachloroethane	TX	5110	10298121
1,1,2-Trichloroethane	TX	5165	10298121
1,1-Dichloroethane	TX	4630	10298121
1,1-Dichloroethylene	TX	4640	10298121
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10298121
1,2-Dichlorobenzene	TX	4610	10298121
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10298121
1,2-Dichloropropane	TX	4655	10298121
1,3-Dichlorobenzene	TX	4615	10298121
1,4-Dichlorobenzene	TX	4620	10298121
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10298121
2-Chloroethyl vinyl ether	TX	4500	10298121
Acetone (2-Propanone)	TX	4315	10298121
Acrolein (Propenal)	TX	4325	10298121
Acrylonitrile	TX	4340	10298121
Benzene	TX	4375	10298121
Bromodichloromethane	TX	4395	10298121
Bromoform	TX	4400	10298121
Carbon tetrachloride	TX	4455	10298121
Chlorobenzene	TX	4475	10298121
Chlorodibromomethane	TX	4575	10298121
Chloroethane (Ethyl chloride)	TX	4485	10298121
Chloroform	TX	4505	10298121
cis-1,2-Dichloroethylene	TX	4645	10298121
cis-1,3-Dichloropropene	TX	4680	10298121
Ethylbenzene	TX	4765	10298121

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Matrix: ***Non-Potable Water***

m+p-xylene	TX	5240	10298121
Methyl bromide (Bromomethane)	TX	4950	10298121
Methyl chloride (Chloromethane)	TX	4960	10298121
Methyl tert-butyl ether (MTBE)	TX	5000	10298121
Methylene chloride (Dichloromethane)	TX	4975	10298121
Naphthalene	TX	5005	10298121
o-Xylene	TX	5250	10298121
Tetrachloroethylene (Perchloroethylene)	TX	5115	10298121
Toluene	TX	5140	10298121
Total trihalomethanes	TX	5205	10298121
trans-1,2-Dichloroethylene	TX	4700	10298121
trans-1,3-Dichloropropylene	TX	4685	10298121
Trichloroethene (Trichloroethylene)	TX	5170	10298121
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10298121
Vinyl chloride	TX	5235	10298121
Xylene (total)	TX	5260	10298121

Method EPA 625

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401
1,2,4-Trichlorobenzene	TX	5155	10107401
1,2-Dichlorobenzene	TX	4610	10107401
1,2-Diphenylhydrazine	TX	6220	10107401
1,3-Dichlorobenzene	TX	4615	10107401
1,4-Dichlorobenzene	TX	4620	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,3,4,6-Tetrachlorophenol	TX	6735	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401

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Matrix: ***Non-Potable Water***

2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401
Acenaphthylene	TX	5505	10107401
Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401
Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401
Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401

Matrix: ***Non-Potable Water***

Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401
n-Nitrosodi-n-butylamine	TX	5025	10107401
n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401
Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401
Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401

Method EPA 625.1

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10300024
1,2,4-Trichlorobenzene	TX	5155	10300024
1,2-Dichlorobenzene	TX	4610	10300024
1,2-Diphenylhydrazine	TX	6221	10300024

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Matrix: ***Non-Potable Water***

1,3-Dichlorobenzene	TX	4615	10300024
1,4-Dichlorobenzene	TX	4620	10300024
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10300024
2,3,4,6-Tetrachlorophenol	TX	6735	10300024
2,4,5-Trichlorophenol	TX	6835	10300024
2,4,6-Trichlorophenol	TX	6840	10300024
2,4-Dichlorophenol	TX	6000	10300024
2,4-Dimethylphenol	TX	6130	10300024
2,4-Dinitrophenol	TX	6175	10300024
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10300024
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10300024
2-Chloronaphthalene	TX	5795	10300024
2-Chlorophenol	TX	5800	10300024
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10300024
2-Methylphenol (o-Cresol)	TX	6400	10300024
2-Nitrophenol	TX	6490	10300024
3,3'-Dichlorobenzidine	TX	5945	10300024
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10300024
4-Chloro-3-methylphenol	TX	5700	10300024
4-Chlorophenyl phenylether	TX	5825	10300024
4-Methylphenol (p-Cresol)	TX	6410	10300024
4-Nitrophenol	TX	6500	10300024
Acenaphthene	TX	5500	10300024
Acenaphthylene	TX	5505	10300024
Anthracene	TX	5555	10300024
Benzidine	TX	5595	10300024
Benzo(a)anthracene	TX	5575	10300024
Benzo(a)pyrene	TX	5580	10300024
Benzo(b)fluoranthene	TX	5585	10300024
Benzo(g,h,i)perylene	TX	5590	10300024

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Matrix: ***Non-Potable Water***

Benzo(k)fluoranthene	TX	5600	10300024
bis(2-Chloroethoxy)methane	TX	5760	10300024
bis(2-Chloroethyl) ether	TX	5765	10300024
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10300024
Butyl benzyl phthalate	TX	5670	10300024
Chrysene	TX	5855	10300024
Dibenz(a,h) anthracene	TX	5895	10300024
Diethyl phthalate	TX	6070	10300024
Dimethyl phthalate	TX	6135	10300024
Di-n-butyl phthalate	TX	5925	10300024
Di-n-octyl phthalate	TX	6200	10300024
Fluoranthene	TX	6265	10300024
Fluorene	TX	6270	10300024
Hexachlorobenzene	TX	6275	10300024
Hexachlorobutadiene	TX	4835	10300024
Hexachlorocyclopentadiene	TX	6285	10300024
Hexachloroethane	TX	4840	10300024
Indeno(1,2,3-cd) pyrene	TX	6315	10300024
Isophorone	TX	6320	10300024
Naphthalene	TX	5005	10300024
Nitrobenzene	TX	5015	10300024
n-Nitrosodiethylamine	TX	6525	10300024
n-Nitrosodimethylamine	TX	6530	10300024
n-Nitrosodi-n-butylamine	TX	5025	10300024
n-Nitrosodi-n-propylamine	TX	6545	10300024
n-Nitrosodiphenylamine	TX	6535	10300024
Pentachlorobenzene	TX	6590	10300024
Pentachlorophenol	TX	6605	10300024
Phenanthrene	TX	6615	10300024
Phenol	TX	6625	10300024

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Matrix: ***Non-Potable Water***

Pyrene	TX	6665	10300024
Pyridine	TX	5095	10300024

Method EPA 632

Analyte	**AB**	**Analyte ID**	**Method ID**
Carbaryl (Sevin)	TX	7195	10108608

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165807

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178606
4,4'-DDE	TX	7360	10178606
4,4'-DDT	TX	7365	10178606
Aldrin	TX	7025	10178606
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178606
alpha-Chlordane	TX	7240	10178606
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178606
Chlordane (tech.)	TX	7250	10178606
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178606
Dieldrin	TX	7470	10178606
Endosulfan I	TX	7510	10178606
Endosulfan II	TX	7515	10178606
Endosulfan sulfate	TX	7520	10178606
Endrin	TX	7540	10178606
Endrin aldehyde	TX	7530	10178606
Endrin ketone	TX	7535	10178606
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178606
gamma-Chlordane	TX	7245	10178606

Matrix: ***Non-Potable Water***

Heptachlor	TX	7685	10178606
Heptachlor epoxide	TX	7690	10178606
Methoxychlor	TX	7810	10178606
Mirex	TX	7870	10178606
Toxaphene (Chlorinated camphene)	TX	8250	10178606

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179007
Aroclor-1221 (PCB-1221)	TX	8885	10179007
Aroclor-1232 (PCB-1232)	TX	8890	10179007
Aroclor-1242 (PCB-1242)	TX	8895	10179007
Aroclor-1248 (PCB-1248)	TX	8900	10179007
Aroclor-1254 (PCB-1254)	TX	8905	10179007
Aroclor-1260 (PCB-1260)	TX	8910	10179007
PCBs (total)	TX	8870	10179007

Method EPA 8151

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	TX	8655	10183207
2,4-D	TX	8545	10183207
2,4-DB	TX	8560	10183207
Dalapon	TX	8555	10183207
Dicamba	TX	8595	10183207
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183207
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183207
MCPA	TX	7775	10183207
MCPP	TX	7780	10183207
Pentachlorophenol	TX	6605	10183207
Silvex (2,4,5-TP)	TX	8650	10183207

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	TX	5105	10184802

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Matrix: ***Non-Potable Water***

1,1,1-Trichloroethane	TX	5160	10184802
1,1,2,2-Tetrachloroethane	TX	5110	10184802
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184802
1,1,2-Trichloroethane	TX	5165	10184802
1,1-Dichloroethane	TX	4630	10184802
1,1-Dichloroethylene	TX	4640	10184802
1,1-Dichloropropene	TX	4670	10184802
1,2,3-Trichlorobenzene	TX	5150	10184802
1,2,3-Trichloropropane	TX	5180	10184802
1,2,4-Trichlorobenzene	TX	5155	10184802
1,2,4-Trimethylbenzene	TX	5210	10184802
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184802
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184802
1,2-Dichlorobenzene	TX	4610	10184802
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184802
1,2-Dichloropropane	TX	4655	10184802
1,3,5-Trimethylbenzene	TX	5215	10184802
1,3-Dichlorobenzene	TX	4615	10184802
1,3-Dichloropropane	TX	4660	10184802
1,4-Dichlorobenzene	TX	4620	10184802
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184802
2,2-Dichloropropane	TX	4665	10184802
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184802
2-Chloroethyl vinyl ether	TX	4500	10184802
2-Chlorotoluene	TX	4535	10184802
2-Hexanone (MBK)	TX	4860	10184802
4-Chlorotoluene	TX	4540	10184802
4-Isopropyltoluene (p-Cymene)	TX	4915	10184802
4-Methyl-2-pentanone (MIBK)	TX	4995	10184802
Acetone (2-Propanone)	TX	4315	10184802

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Matrix: ***Non-Potable Water***

Acetonitrile	TX	4320	10184802
Acrolein (Propenal)	TX	4325	10184802
Acrylonitrile	TX	4340	10184802
Allyl chloride (3-Chloropropene)	TX	4355	10184802
Benzene	TX	4375	10184802
Benzyl chloride	TX	5635	10184802
Bromobenzene	TX	4385	10184802
Bromochloromethane	TX	4390	10184802
Bromodichloromethane	TX	4395	10184802
Bromoform	TX	4400	10184802
Carbon disulfide	TX	4450	10184802
Carbon tetrachloride	TX	4455	10184802
Chlorobenzene	TX	4475	10184802
Chlorodibromomethane	TX	4575	10184802
Chloroethane (Ethyl chloride)	TX	4485	10184802
Chloroform	TX	4505	10184802
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184802
cis-1,2-Dichloroethylene	TX	4645	10184802
cis-1,3-Dichloropropene	TX	4680	10184802
Dibromomethane (Methylene bromide)	TX	4595	10184802
Dichlorodifluoromethane (Freon-12)	TX	4625	10184802
Ethyl acetate	TX	4755	10184802
Ethyl methacrylate	TX	4810	10184802
Ethylbenzene	TX	4765	10184802
Hexachlorobutadiene	TX	4835	10184802
Hexachloroethane	TX	4840	10184802
Iodomethane (Methyl iodide)	TX	4870	10184802
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184802
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184802
Isopropylbenzene (Cumene)	TX	4900	10184802

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Matrix: ***Non-Potable Water***

m+p-xylene	TX	5240	10184802
Methacrylonitrile	TX	4925	10184802
Methyl acetate	TX	4940	10184802
Methyl bromide (Bromomethane)	TX	4950	10184802
Methyl chloride (Chloromethane)	TX	4960	10184802
Methyl methacrylate	TX	4990	10184802
Methyl tert-butyl ether (MTBE)	TX	5000	10184802
Methylene chloride (Dichloromethane)	TX	4975	10184802
Naphthalene	TX	5005	10184802
n-Butylbenzene	TX	4435	10184802
n-Propylbenzene	TX	5090	10184802
o-Xylene	TX	5250	10184802
Pentachloroethane	TX	5035	10184802
Propionitrile (Ethyl cyanide)	TX	5080	10184802
sec-Butylbenzene	TX	4440	10184802
Styrene	TX	5100	10184802
tert-Butylbenzene	TX	4445	10184802
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184802
Toluene	TX	5140	10184802
trans-1,2-Dichloroethylene	TX	4700	10184802
trans-1,3-Dichloropropylene	TX	4685	10184802
trans-1,4-Dichloro-2-butene	TX	4605	10184802
Trichloroethene (Trichloroethylene)	TX	5170	10184802
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184802
Vinyl acetate	TX	5225	10184802
Vinyl chloride	TX	5235	10184802
Xylene (total)	TX	5260	10184802

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10185805

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Matrix: ***Non-Potable Water***

1,2,4-Trichlorobenzene	TX	5155	10185805
1,2-Dichlorobenzene	TX	4610	10185805
1,2-Dinitrobenzene	TX	6155	10185805
1,3-Dichlorobenzene	TX	4615	10185805
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185805
1,4-Dichlorobenzene	TX	4620	10185805
1,4-Dinitrobenzene	TX	6165	10185805
1,4-Naphthoquinone	TX	6420	10185805
1-Chloronaphthalene	TX	5790	10185805
1-Naphthylamine	TX	6425	10185805
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185805
2,3,4,6-Tetrachlorophenol	TX	6735	10185805
2,4,5-Trichlorophenol	TX	6835	10185805
2,4,6-Trichlorophenol	TX	6840	10185805
2,4-Dichlorophenol	TX	6000	10185805
2,4-Dimethylphenol	TX	6130	10185805
2,4-Dinitrophenol	TX	6175	10185805
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185805
2,6-Dichlorophenol	TX	6005	10185805
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185805
2-Acetylaminofluorene	TX	5515	10185805
2-Chloronaphthalene	TX	5795	10185805
2-Chlorophenol	TX	5800	10185805
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185805
2-Methylaniline (o-Toluidine)	TX	5145	10185805
2-Methylnaphthalene	TX	6385	10185805
2-Methylphenol (o-Cresol)	TX	6400	10185805
2-Naphthylamine	TX	6430	10185805
2-Nitroaniline	TX	6460	10185805
2-Nitrophenol	TX	6490	10185805

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Matrix: ***Non-Potable Water***

2-Picoline (2-Methylpyridine)	TX	5050	10185805
3,3'-Dichlorobenzidine	TX	5945	10185805
3-Methylcholanthrene	TX	6355	10185805
3-Methylphenol (m-Cresol)	TX	6405	10185805
3-Nitroaniline	TX	6465	10185805
4-Aminobiphenyl	TX	5540	10185805
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185805
4-Chloro-3-methylphenol	TX	5700	10185805
4-Chloroaniline	TX	5745	10185805
4-Chlorophenyl phenylether	TX	5825	10185805
4-Dimethyl aminoazobenzene	TX	6105	10185805
4-Methylphenol (p-Cresol)	TX	6410	10185805
4-Nitroaniline	TX	6470	10185805
4-Nitrobiphenyl	TX	6480	10185805
4-Nitrophenol	TX	6500	10185805
5,5-Diphenylhydantoin	TX	6215	10185805
5-Chloro-2-methylaniline	TX	5695	10185805
5-Nitroacenaphthene	TX	6455	10185805
5-Nitro-o-toluidine	TX	6570	10185805
7,12-Dimethylbenz(a) anthracene	TX	6115	10185805
Acenaphthene	TX	5500	10185805
Acenaphthylene	TX	5505	10185805
Acetophenone	TX	5510	10185805
Aminoazobenzene	TX	5535	10185805
Aniline	TX	5545	10185805
Anthracene	TX	5555	10185805
Azobenzene	TX	5562	10185805
Benzidine	TX	5595	10185805
Benzo(a)anthracene	TX	5575	10185805
Benzo(a)pyrene	TX	5580	10185805

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Matrix: ***Non-Potable Water***

Benzo(b)fluoranthene	TX	5585	10185805
Benzo(g,h,i)perylene	TX	5590	10185805
Benzo(k)fluoranthene	TX	5600	10185805
Benzoic acid	TX	5610	10185805
Benzyl alcohol	TX	5630	10185805
bis(2-Chloroethoxy)methane	TX	5760	10185805
bis(2-Chloroethyl) ether	TX	5765	10185805
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185805
Butyl benzyl phthalate	TX	5670	10185805
Carbazole	TX	5680	10185805
Chrysene	TX	5855	10185805
Dibenz(a,h) anthracene	TX	5895	10185805
Dibenzofuran	TX	5905	10185805
Diethyl phthalate	TX	6070	10185805
Diethylstilbestrol	TX	6075	10185805
Dimethyl phthalate	TX	6135	10185805
Di-n-butyl phthalate	TX	5925	10185805
Di-n-octyl phthalate	TX	6200	10185805
Diphenylamine	TX	6205	10185805
Ethyl methanesulfonate	TX	6260	10185805
Fluoranthene	TX	6265	10185805
Fluorene	TX	6270	10185805
Hexachlorobenzene	TX	6275	10185805
Hexachlorobutadiene	TX	4835	10185805
Hexachlorocyclopentadiene	TX	6285	10185805
Hexachloroethane	TX	4840	10185805
Hexachloropropene	TX	6295	10185805
Indeno(1,2,3-cd) pyrene	TX	6315	10185805
Isodrin	TX	7725	10185805
Isophorone	TX	6320	10185805

Matrix: *Non-Potable Water*

Isosafrole	TX	6325	10185805
Mestranol	TX	6340	10185805
Methyl methanesulfonate	TX	6375	10185805
Naphthalene	TX	5005	10185805
Nitrobenzene	TX	5015	10185805
n-Nitrosodiethylamine	TX	6525	10185805
n-Nitrosodimethylamine	TX	6530	10185805
n-Nitrosodi-n-butylamine	TX	5025	10185805
n-Nitrosodi-n-propylamine	TX	6545	10185805
n-Nitrosodiphenylamine	TX	6535	10185805
n-Nitrosomethylethylamine	TX	6550	10185805
n-Nitrosomorpholine	TX	6555	10185805
n-Nitrosopiperidine	TX	6560	10185805
n-Nitrosopyrrolidine	TX	6565	10185805
o-Anisidine	TX	5550	10185805
p-Cresidine	TX	5860	10185805
Pentachlorobenzene	TX	6590	10185805
Pentachloronitrobenzene (PCNB)	TX	6600	10185805
Pentachlorophenol	TX	6605	10185805
Phenacetin	TX	6610	10185805
Phenanthrene	TX	6615	10185805
Phenol	TX	6625	10185805
Pronamide (Kerb)	TX	6650	10185805
Pyrene	TX	6665	10185805
Pyridine	TX	5095	10185805
Safrole	TX	6685	10185805

Method EPA 9014

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

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Matrix: ***Non-Potable Water***

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	10196802

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198808

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10200201

Method EPA 9065

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10200405

Method IDEXX Laboratories Colilert®

Analyte	**AB**	**Analyte ID**	**Method ID**
Escherichia coli (enumeration)	TX	2525	60002600

Method SM 2120 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Color	TX	1605	20223807

Method SM 2320 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	20045005

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Matrix: ***Non-Potable Water***

Method SM 2340 B

Analyte	AB	Analyte ID	Method ID
Total hardness as CaCO3	TX	1755	20046008

Method SM 2540 B

Analyte	AB	Analyte ID	Method ID
Residue-total (total solids)	TX	1950	20004608

Method SM 2540 C

Analyte	AB	Analyte ID	Method ID
Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	AB	Analyte ID	Method ID
Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 2540 F

Analyte	AB	Analyte ID	Method ID
Residue-settleable	TX	1965	20005009

Method SM 3500-Cr B

Analyte	AB	Analyte ID	Method ID
Chromium (VI)	TX	1045	20065809

Method SM 3500-Fe D

Analyte	AB	Analyte ID	Method ID
Iron	TX	1070	20009603

Method SM 4500-CN^- E

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	20021209

Method SM 4500-CN^- G

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	20021607

Method SM 4500-H+ B

Analyte	AB	Analyte ID	Method ID
pH	TX	1900	20104603

Method SM 4500-NH3 H

Analyte	AB	Analyte ID	Method ID

Matrix: ***Non-Potable Water***

Ammonia as N	TX	1515	20023409

Method SM 4500-O C

Analyte	**AB**	**Analyte ID**	**Method ID**
Oxygen, dissolved	TX	1880	20025201

Method SM 4500-P E

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	TX	1870	20025803
Phosphorus	TX	1910	20025803

Method SM 4500-S2‾ D

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	TX	2005	20125400

Method SM 4500-S2‾ F

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	TX	2005	20126209

Method SM 5210 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5220 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	20027809

Method SM 5310 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	20138209

Method SM 5540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Surfactants - MBAS	TX	2025	20144405

Method SM 9222 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total coliforms (enumeration)	TX	2500	20198009

Method SM 9222 D

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

Fecal coliforms (enumeration)	TX	2530	20037405

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

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Matrix: ***Solid & Chemical Materials***

Method EPA 1010

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	TX	1780	10116606

Method EPA 1030

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	TX	1780	10117201

Method EPA 1311

Analyte	**AB**	**Analyte ID**	**Method ID**
TCLP	TX	849	10118806

Method EPA 1312

Analyte	**AB**	**Analyte ID**	**Method ID**
SPLP	TX	850	10119003

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Sulfate	TX	2000	10053200

Method EPA 353.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrate as N	TX	1810	10067604
Nitrate-nitrite	TX	1820	10067604
Nitrite as N	TX	1840	10067604

Method EPA 6010

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10155609
Antimony	TX	1005	10155609
Arsenic	TX	1010	10155609

Matrix: ***Solid & Chemical Materials***

Barium	TX	1015	10155609
Beryllium	TX	1020	10155609
Boron	TX	1025	10155609
Cadmium	TX	1030	10155609
Calcium	TX	1035	10155609
Chromium	TX	1040	10155609
Cobalt	TX	1050	10155609
Copper	TX	1055	10155609
Iron	TX	1070	10155609
Lead	TX	1075	10155609
Magnesium	TX	1085	10155609
Manganese	TX	1090	10155609
Molybdenum	TX	1100	10155609
Nickel	TX	1105	10155609
Potassium	TX	1125	10155609
Selenium	TX	1140	10155609
Silver	TX	1150	10155609
Strontium	TX	1160	10155609
Thallium	TX	1165	10155609
Tin	TX	1175	10155609
Titanium	TX	1180	10155609
Vanadium	TX	1185	10155609
Zinc	TX	1190	10155609

Method EPA 6020

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419

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Matrix: ***Solid & Chemical Materials***

Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Thallium	TX	1165	10156419
Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10166208

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178606
4,4'-DDE	TX	7360	10178606
4,4'-DDT	TX	7365	10178606
Aldrin	TX	7025	10178606
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178606
alpha-Chlordane	TX	7240	10178606
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178606
Chlordane (tech.)	TX	7250	10178606
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178606

Matrix: ***Solid & Chemical Materials***

Dieldrin	TX	7470	10178606
Endosulfan I	TX	7510	10178606
Endosulfan II	TX	7515	10178606
Endosulfan sulfate	TX	7520	10178606
Endrin	TX	7540	10178606
Endrin aldehyde	TX	7530	10178606
Endrin ketone	TX	7535	10178606
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178606
gamma-Chlordane	TX	7245	10178606
Heptachlor	TX	7685	10178606
Heptachlor epoxide	TX	7690	10178606
Methoxychlor	TX	7810	10178606
Mirex	TX	7870	10178606
Toxaphene (Chlorinated camphene)	TX	8250	10178606

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179007
Aroclor-1221 (PCB-1221)	TX	8885	10179007
Aroclor-1232 (PCB-1232)	TX	8890	10179007
Aroclor-1242 (PCB-1242)	TX	8895	10179007
Aroclor-1248 (PCB-1248)	TX	8900	10179007
Aroclor-1254 (PCB-1254)	TX	8905	10179007
Aroclor-1260 (PCB-1260)	TX	8910	10179007
PCBs (total)	TX	8870	10179007

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	TX	5105	10184802
1,1,1-Trichloroethane	TX	5160	10184802
1,1,2,2-Tetrachloroethane	TX	5110	10184802
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184802
1,1,2-Trichloroethane	TX	5165	10184802

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704232-19-29
Expiration Date: 6/30/2020
Issue Date: 7/25/2019

Pace Analytical Services, LLC - Dallas, TX

400 West Bethany Drive, Suite 190
Allen, TX 75013-3714

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Matrix: ***Solid & Chemical Materials***

1,1-Dichloroethane	TX	4630	10184802
1,1-Dichloroethylene	TX	4640	10184802
1,1-Dichloropropene	TX	4670	10184802
1,2,3-Trichlorobenzene	TX	5150	10184802
1,2,3-Trichloropropane	TX	5180	10184802
1,2,4-Trichlorobenzene	TX	5155	10184802
1,2,4-Trimethylbenzene	TX	5210	10184802
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184802
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184802
1,2-Dichlorobenzene	TX	4610	10184802
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184802
1,2-Dichloropropane	TX	4655	10184802
1,3,5-Trimethylbenzene	TX	5215	10184802
1,3-Dichlorobenzene	TX	4615	10184802
1,3-Dichloropropane	TX	4660	10184802
1,4-Dichlorobenzene	TX	4620	10184802
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184802
2,2-Dichloropropane	TX	4665	10184802
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184802
2-Chloroethyl vinyl ether	TX	4500	10184802
2-Chlorotoluene	TX	4535	10184802
2-Hexanone (MBK)	TX	4860	10184802
4-Chlorotoluene	TX	4540	10184802
4-Isopropyltoluene (p-Cymene)	TX	4915	10184802
4-Methyl-2-pentanone (MIBK)	TX	4995	10184802
Acetone (2-Propanone)	TX	4315	10184802
Acetonitrile	TX	4320	10184802
Acrolein (Propenal)	TX	4325	10184802
Acrylonitrile	TX	4340	10184802
Allyl chloride (3-Chloropropene)	TX	4355	10184802

Texas Commission on Environmental Quality

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Matrix: ***Solid & Chemical Materials***

Benzene	TX	4375	10184802
Benzyl chloride	TX	5635	10184802
Bromobenzene	TX	4385	10184802
Bromochloromethane	TX	4390	10184802
Bromodichloromethane	TX	4395	10184802
Bromoform	TX	4400	10184802
Carbon disulfide	TX	4450	10184802
Carbon tetrachloride	TX	4455	10184802
Chlorobenzene	TX	4475	10184802
Chlorodibromomethane	TX	4575	10184802
Chloroethane (Ethyl chloride)	TX	4485	10184802
Chloroform	TX	4505	10184802
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184802
cis-1,2-Dichloroethylene	TX	4645	10184802
cis-1,3-Dichloropropene	TX	4680	10184802
Dibromomethane (Methylene bromide)	TX	4595	10184802
Dichlorodifluoromethane (Freon-12)	TX	4625	10184802
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184802
Ethyl acetate	TX	4755	10184802
Ethyl methacrylate	TX	4810	10184802
Ethylbenzene	TX	4765	10184802
Hexachlorobutadiene	TX	4835	10184802
Hexachloroethane	TX	4840	10184802
Iodomethane (Methyl iodide)	TX	4870	10184802
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184802
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184802
Isopropylbenzene (Cumene)	TX	4900	10184802
m+p-xylene	TX	5240	10184802
Methacrylonitrile	TX	4925	10184802
Methyl acetate	TX	4940	10184802

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Matrix: ***Solid & Chemical Materials***

Methyl bromide (Bromomethane)	TX	4950	10184802
Methyl chloride (Chloromethane)	TX	4960	10184802
Methyl methacrylate	TX	4990	10184802
Methyl tert-butyl ether (MTBE)	TX	5000	10184802
Methylene chloride (Dichloromethane)	TX	4975	10184802
Naphthalene	TX	5005	10184802
n-Butylbenzene	TX	4435	10184802
n-Propylbenzene	TX	5090	10184802
o-Xylene	TX	5250	10184802
Pentachloroethane	TX	5035	10184802
Propionitrile (Ethyl cyanide)	TX	5080	10184802
sec-Butylbenzene	TX	4440	10184802
Styrene	TX	5100	10184802
tert-Butylbenzene	TX	4445	10184802
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184802
Toluene	TX	5140	10184802
trans-1,2-Dichloroethylene	TX	4700	10184802
trans-1,3-Dichloropropylene	TX	4685	10184802
trans-1,4-Dichloro-2-butene	TX	4605	10184802
Trichloroethene (Trichloroethylene)	TX	5170	10184802
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184802
Vinyl acetate	TX	5225	10184802
Vinyl chloride	TX	5235	10184802
Xylene (total)	TX	5260	10184802

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10185805
1,2,4-Trichlorobenzene	TX	5155	10185805
1,2-Dichlorobenzene	TX	4610	10185805
1,2-Dinitrobenzene	TX	6155	10185805

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Matrix: ***Solid & Chemical Materials***

1,3-Dichlorobenzene	TX	4615	10185805
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185805
1,4-Dichlorobenzene	TX	4620	10185805
1,4-Dinitrobenzene	TX	6165	10185805
1,4-Naphthoquinone	TX	6420	10185805
1-Chloronaphthalene	TX	5790	10185805
1-Naphthylamine	TX	6425	10185805
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185805
2,3,4,6-Tetrachlorophenol	TX	6735	10185805
2,4,5-Trichlorophenol	TX	6835	10185805
2,4,6-Trichlorophenol	TX	6840	10185805
2,4-Dichlorophenol	TX	6000	10185805
2,4-Dimethylphenol	TX	6130	10185805
2,4-Dinitrophenol	TX	6175	10185805
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185805
2,6-Dichlorophenol	TX	6005	10185805
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185805
2-Acetylaminofluorene	TX	5515	10185805
2-Chloronaphthalene	TX	5795	10185805
2-Chlorophenol	TX	5800	10185805
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185805
2-Methylaniline (o-Toluidine)	TX	5145	10185805
2-Methylnaphthalene	TX	6385	10185805
2-Methylphenol (o-Cresol)	TX	6400	10185805
2-Naphthylamine	TX	6430	10185805
2-Nitroaniline	TX	6460	10185805
2-Nitrophenol	TX	6490	10185805
2-Picoline (2-Methylpyridine)	TX	5050	10185805
3,3'-Dichlorobenzidine	TX	5945	10185805
3-Methylcholanthrene	TX	6355	10185805

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Matrix: ***Solid & Chemical Materials***

3-Methylphenol (m-Cresol)	TX	6405	10185805
3-Nitroaniline	TX	6465	10185805
4-Aminobiphenyl	TX	5540	10185805
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185805
4-Chloro-3-methylphenol	TX	5700	10185805
4-Chloroaniline	TX	5745	10185805
4-Chlorophenyl phenylether	TX	5825	10185805
4-Methylphenol (p-Cresol)	TX	6410	10185805
4-Nitroaniline	TX	6470	10185805
4-Nitrobiphenyl	TX	6480	10185805
4-Nitrophenol	TX	6500	10185805
5,5-Diphenylhydantoin	TX	6215	10185805
5-Chloro-2-methylaniline	TX	5695	10185805
5-Nitroacenaphthene	TX	6455	10185805
5-Nitro-o-toluidine	TX	6570	10185805
7,12-Dimethylbenz(a) anthracene	TX	6115	10185805
Acenaphthene	TX	5500	10185805
Acenaphthylene	TX	5505	10185805
Acetophenone	TX	5510	10185805
Aminoazobenzene	TX	5535	10185805
Aniline	TX	5545	10185805
Anthracene	TX	5555	10185805
Azobenzene	TX	5562	10185805
Benzidine	TX	5595	10185805
Benzo(a)anthracene	TX	5575	10185805
Benzo(a)pyrene	TX	5580	10185805
Benzo(b)fluoranthene	TX	5585	10185805
Benzo(g,h,i)perylene	TX	5590	10185805
Benzo(k)fluoranthene	TX	5600	10185805
Benzoic acid	TX	5610	10185805

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Matrix: ***Solid & Chemical Materials***

Benzyl alcohol	TX	5630	10185805
bis(2-Chloroethoxy)methane	TX	5760	10185805
bis(2-Chloroethyl) ether	TX	5765	10185805
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185805
Butyl benzyl phthalate	TX	5670	10185805
Carbazole	TX	5680	10185805
Chrysene	TX	5855	10185805
Dibenz(a,h) anthracene	TX	5895	10185805
Dibenzofuran	TX	5905	10185805
Diethyl phthalate	TX	6070	10185805
Diethyl sulfate	TX	6080	10185805
Diethylstilbestrol	TX	6075	10185805
Dimethyl phthalate	TX	6135	10185805
Di-n-butyl phthalate	TX	5925	10185805
Di-n-octyl phthalate	TX	6200	10185805
Diphenylamine	TX	6205	10185805
Ethyl methanesulfonate	TX	6260	10185805
Fluoranthene	TX	6265	10185805
Fluorene	TX	6270	10185805
Hexachlorobenzene	TX	6275	10185805
Hexachlorobutadiene	TX	4835	10185805
Hexachlorocyclopentadiene	TX	6285	10185805
Hexachloroethane	TX	4840	10185805
Hexachloropropene	TX	6295	10185805
Indeno(1,2,3-cd) pyrene	TX	6315	10185805
Isodrin	TX	7725	10185805
Isophorone	TX	6320	10185805
Isosafrole	TX	6325	10185805
Mestranol	TX	6340	10185805
Methyl methanesulfonate	TX	6375	10185805

Matrix: ***Solid & Chemical Materials***

Methylphenols, total	TX	10313	10185805
Naphthalene	TX	5005	10185805
Nitrobenzene	TX	5015	10185805
n-Nitrosodiethylamine	TX	6525	10185805
n-Nitrosodimethylamine	TX	6530	10185805
n-Nitrosodi-n-butylamine	TX	5025	10185805
n-Nitrosodi-n-propylamine	TX	6545	10185805
n-Nitrosodiphenylamine	TX	6535	10185805
n-Nitrosomethylethylamine	TX	6550	10185805
n-Nitrosomorpholine	TX	6555	10185805
n-Nitrosopiperidine	TX	6560	10185805
n-Nitrosopyrrolidine	TX	6565	10185805
o-Anisidine	TX	5550	10185805
p-Cresidine	TX	5860	10185805
Pentachlorobenzene	TX	6590	10185805
Pentachloronitrobenzene (PCNB)	TX	6600	10185805
Pentachlorophenol	TX	6605	10185805
Phenacetin	TX	6610	10185805
Phenanthrene	TX	6615	10185805
Phenol	TX	6625	10185805
Pronamide (Kerb)	TX	6650	10185805
Pyrene	TX	6665	10185805
Pyridine	TX	5095	10185805
Safrole	TX	6685	10185805

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10196802

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Matrix: ***Solid & Chemical Materials***

pH	TX	1900	10196802

Method EPA 9045

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10197805
pH	TX	1900	10197805

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198808

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Sulfate	TX	2000	10199209

Method EPA 9065

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10200405

Method EPA 9095

Analyte	**AB**	**Analyte ID**	**Method ID**
Paint Filter Liquids Test	TX	10312	10204009

Method EPA 9250

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	10207202

Method SM 9221 C / 9221 E

Analyte	**AB**	**Analyte ID**	**Method ID**
Fecal coliforms (enumeration)	TX	2530	20195806

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Solid & Chemical Materials***

Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

Environmental Science Corp. dba: Pace Analytical National Center for Testing & Innovation

12065 Lebanon Road
Mount Juliet, TN 37122-2508

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704245-19-16
Effective Date: 11/1/2019
Expiration Date: 10/31/2020

Executive Director Texas Commission on Environmental Quality

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704245-19-16

Environmental Science Corp. dba: Pace Analytical National Center for Testing & Innovation

Expiration Date: 10/31/2020

12065 Lebanon Road
Mount Juliet, TN 37122-2508

Issue Date: 11/1/2019

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Matrix: ***Air & Emissions***

Method EPA TO-15

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	LA-DEQ	5160	10248803
1,1,2,2-Tetrachloroethane	LA-DEQ	5110	10248803
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	LA-DEQ	5195	10248803
1,1,2-Trichloroethane	LA-DEQ	5165	10248803
1,1-Dichloroethane	LA-DEQ	4630	10248803
1,1-Dichloroethylene	LA-DEQ	4640	10248803
1,2,3-Trimethylbenzene	LA-DEQ	5182	10248803
1,2,4-Trichlorobenzene	LA-DEQ	5155	10248803
1,2,4-Trimethylbenzene	LA-DEQ	5210	10248803
1,2-Dibromoethane (EDB, Ethylene dibromide)	LA-DEQ	4585	10248803
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	LA-DEQ	4695	10248803
1,2-Dichlorobenzene	LA-DEQ	4610	10248803
1,2-Dichloroethane (Ethylene dichloride)	LA-DEQ	4635	10248803
1,2-Dichloropropane	LA-DEQ	4655	10248803
1,3,5-Trimethylbenzene	LA-DEQ	5215	10248803
1,3-Butadiene	LA-DEQ	9318	10248803
1,3-Dichlorobenzene	LA-DEQ	4615	10248803
1,4-Dichlorobenzene	LA-DEQ	4620	10248803
1,4-Dioxane (1,4-Diethyleneoxide)	LA-DEQ	4735	10248803
1-Propene (Propylene)	LA-DEQ	4836	10248803
2,2,4-Trimethylpentane (Isooctane)	LA-DEQ	5220	10248803
2-Butanone (Methyl ethyl ketone, MEK)	LA-DEQ	4410	10248803
4-Ethyltoluene	LA-DEQ	4542	10248803
Acetaldehyde	LA-DEQ	4300	10248803
Acetonitrile	LA-DEQ	4320	10248803
Acrylonitrile	LA-DEQ	4340	10248803
Benzene	LA-DEQ	4375	10248803
Benzyl chloride	LA-DEQ	5635	10248803

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Matrix: ***Air & Emissions***

Bromodichloromethane	LA-DEQ	4395	10248803
Bromoform	LA-DEQ	4400	10248803
Carbon tetrachloride	LA-DEQ	4455	10248803
Chlorobenzene	LA-DEQ	4475	10248803
Chlorodibromomethane	LA-DEQ	4575	10248803
Chloroethane (Ethyl chloride)	LA-DEQ	4485	10248803
Chloroform	LA-DEQ	4505	10248803
cis-1,2-Dichloroethylene	LA-DEQ	4645	10248803
cis-1,3-Dichloropropene	LA-DEQ	4680	10248803
Cyclohexane	LA-DEQ	4555	10248803
Dichlorodifluoromethane (Freon-12)	LA-DEQ	4625	10248803
Ethylbenzene	LA-DEQ	4765	10248803
Hexachlorobutadiene	LA-DEQ	4835	10248803
Isopropylbenzene (Cumene)	LA-DEQ	4900	10248803
m+p-xylene	LA-DEQ	5240	10248803
Methanol	LA-DEQ	4930	10248803
Methyl bromide (Bromomethane)	LA-DEQ	4950	10248803
Methyl chloride (Chloromethane)	LA-DEQ	4960	10248803
Methyl isobutyl ketone (Hexone) (MIBK)	LA-DEQ	4985	10248803
Methyl methacrylate	LA-DEQ	4990	10248803
Methyl tert-butyl ether (MTBE)	LA-DEQ	5000	10248803
Methylcyclohexane	LA-DEQ	4965	10248803
Methylene chloride (Dichloromethane)	LA-DEQ	4975	10248803
n-Butane	LA-DEQ	5007	10248803
n-Heptane	LA-DEQ	4825	10248803
n-Hexane	LA-DEQ	4850	10248803
n-Nonane	LA-DEQ	5026	10248803
n-Pentane	LA-DEQ	5028	10248803
n-Propylbenzene	LA-DEQ	5090	10248803
o-Xylene	LA-DEQ	5250	10248803

Matrix: ***Air & Emissions***

Styrene	LA-DEQ	5100	10248803
Tetrachloroethylene (Perchloroethylene)	LA-DEQ	5115	10248803
Toluene	LA-DEQ	5140	10248803
trans-1,2-Dichloroethylene	LA-DEQ	4700	10248803
trans-1,3-Dichloropropylene	LA-DEQ	4685	10248803
Trichloroethene (Trichloroethylene)	LA-DEQ	5170	10248803
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	LA-DEQ	5175	10248803
Vinyl acetate	LA-DEQ	5225	10248803
Vinyl bromide (Bromoethene)	LA-DEQ	5230	10248803
Vinyl chloride	LA-DEQ	5235	10248803
Xylene (total)	LA-DEQ	5260	10248803

Certificate: T104704245-19-16

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Expiration Date: 10/31/2020

Issue Date: 11/1/2019

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Matrix: ***Drinking Water***

Method ASTM D5174

Analyte	**AB**	**Analyte ID**	**Method ID**
Uranium	LA-DHH	3035	30031608

Method EPA 200.7

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	LA-DHH	1000	10013806
Barium	LA-DHH	1015	10013806
Beryllium	LA-DHH	1020	10013806
Boron	LA-DHH	1025	10013806
Cadmium	LA-DHH	1030	10013806
Chromium	LA-DHH	1040	10013806
Copper	LA-DHH	1055	10013806
Iron	LA-DHH	1070	10013806
Magnesium	LA-DHH	1085	10013806
Manganese	LA-DHH	1090	10013806
Molybdenum	LA-DHH	1100	10013806
Nickel	LA-DHH	1105	10013806
Potassium	LA-DHH	1125	10013806
Silica as SiO2	LA-DHH	1990	10013806
Silver	LA-DHH	1150	10013806
Sodium	LA-DHH	1155	10013806
Vanadium	LA-DHH	1185	10013806
Zinc	LA-DHH	1190	10013806

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	LA-DHH	1000	10014605
Antimony	LA-DHH	1005	10014605
Arsenic	LA-DHH	1010	10014605
Barium	LA-DHH	1015	10014605
Beryllium	LA-DHH	1020	10014605
Cadmium	LA-DHH	1030	10014605

Matrix: ***Drinking Water***

Chromium	LA-DHH	1040	10014605
Copper	LA-DHH	1055	10014605
Lead	LA-DHH	1075	10014605
Manganese	LA-DHH	1090	10014605
Nickel	LA-DHH	1105	10014605
Selenium	LA-DHH	1140	10014605
Silver	LA-DHH	1150	10014605
Thallium	LA-DHH	1165	10014605
Uranium	LA-DHH	3035	10014605
Zinc	LA-DHH	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	LA-DHH	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	LA-DHH	1540	10053200
Chloride	LA-DHH	1575	10053200
Fluoride	LA-DHH	1730	10053200
Nitrate as N	LA-DHH	1810	10053200
Nitrite as N	LA-DHH	1840	10053200
Sulfate	LA-DHH	2000	10053200

Method EPA 314.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Perchlorate	LA-DHH	1895	10277006

Method EPA 335.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	LA-DHH	1645	10061402

Method EPA 353.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrate as N	LA-DHH	1810	10067604
Nitrite as N	LA-DHH	1840	10067604

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Matrix: ***Drinking Water***

Method EPA 504.1

Analyte	AB	Analyte ID	Method ID
1,2-Dibromo-3-chloropropane (DBCP)	LA-DHH	4570	10082801
1,2-Dibromoethane (EDB, Ethylene dibromide)	LA-DHH	4585	10082801

Method EPA 524.2

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	LA-DHH	5160	10088809
1,1,2-Trichloroethane	LA-DHH	5165	10088809
1,1-Dichloroethylene	LA-DHH	4640	10088809
1,2,4-Trichlorobenzene	LA-DHH	5155	10088809
1,2-Dichlorobenzene	LA-DHH	4610	10088809
1,2-Dichloroethane (Ethylene dichloride)	LA-DHH	4635	10088809
1,2-Dichloropropane	LA-DHH	4655	10088809
1,4-Dichlorobenzene	LA-DHH	4620	10088809
Benzene	LA-DHH	4375	10088809
Carbon tetrachloride	LA-DHH	4455	10088809
Chlorobenzene	LA-DHH	4475	10088809
cis-1,2-Dichloroethylene	LA-DHH	4645	10088809
Ethylbenzene	LA-DHH	4765	10088809
Methylene chloride (Dichloromethane)	LA-DHH	4975	10088809
Styrene	LA-DHH	5100	10088809
Tetrachloroethylene (Perchloroethylene)	LA-DHH	5115	10088809
Toluene	LA-DHH	5140	10088809
Total trihalomethanes	LA-DHH	5205	10088809
trans-1,2-Dichloroethylene	LA-DHH	4700	10088809
Trichloroethene (Trichloroethylene)	LA-DHH	5170	10088809
Vinyl chloride	LA-DHH	5235	10088809
Xylene (total)	LA-DHH	5260	10088809

Method EPA 552.2

Analyte	AB	Analyte ID	Method ID
Total haloacetic acids	LA-DHH	9414	10095804

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Matrix: ***Drinking Water***

Method EPA 900.0

Analyte	AB	Analyte ID	Method ID
Gross-alpha	LA-DHH	2830	10308200
Gross-beta	LA-DHH	2840	10308200

Method EPA 901.1

Analyte	AB	Analyte ID	Method ID
Gross gamma	LA-DHH	2855	10308608

Method EPA 903.0

Analyte	AB	Analyte ID	Method ID
Radium-226	LA-DHH	2965	10309407

Method EPA 904.0

Analyte	AB	Analyte ID	Method ID
Radium-228	LA-DHH	2970	10309805

Method EPA 905.0

Analyte	AB	Analyte ID	Method ID
Strontium-89	LA-DHH	2995	10310006
Strontium-90	LA-DHH	3005	10310006

Method EPA 906.0

Analyte	AB	Analyte ID	Method ID
Tritium	LA-DHH	3030	10310200

Method SM 2510 B

Analyte	AB	Analyte ID	Method ID
Conductivity	LA-DHH	1610	20048004

Method SM 2540 C

Analyte	AB	Analyte ID	Method ID
Residue-filterable (TDS)	LA-DHH	1955	20049803

Method SM 4110 B

Analyte	AB	Analyte ID	Method ID
Fluoride	LA-DHH	1730	20076408
Nitrate as N	LA-DHH	1810	20076408
Nitrite as N	LA-DHH	1840	20076408

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Matrix: ***Drinking Water***

Method SM 4500-CN^- C,E

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	LA-DHH	1645	20092404

Method SM 4500-CN^- C,G

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	LA-DHH	1510	20093203

Method SM 7500-Ra B

Analyte	**AB**	**Analyte ID**	**Method ID**
Radium-226	LA-DHH	2965	20170007

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Matrix: ***Non-Potable Water***

Method EPA 1000.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Chronic toxicity	LA-DEQ	3325	10252605

Method EPA 1002.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Chronic toxicity	LA-DEQ	3325	10253006

Method EPA 1010

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	LA-DEQ	1780	10116606

Method EPA 120.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	LA-DEQ	1610	10006403

Method EPA 130.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Total hardness as CaCO3	LA-DEQ	1755	10006801

Method EPA 1311

Analyte	**AB**	**Analyte ID**	**Method ID**
TCLP	LA-DEQ	849	10118806

Method EPA 1312

Analyte	**AB**	**Analyte ID**	**Method ID**
SPLP	LA-DEQ	850	10119003

Method EPA 150.1

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	LA-DEQ	1900	10008409

Method EPA 160.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-volatile	LA-DEQ	1970	10010409

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	LA-DEQ	1803	10127807
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	LA-DEQ	10220	10127807

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Matrix: ***Non-Potable Water***

Method EPA 180.1

Analyte	AB	Analyte ID	Method ID
Turbidity	LA-DEQ	2055	10011606

Method EPA 200.7

Analyte	AB	Analyte ID	Method ID
Aluminum	LA-DEQ	1000	10013806
Antimony	LA-DEQ	1005	10013806
Arsenic	LA-DEQ	1010	10013806
Barium	LA-DEQ	1015	10013806
Beryllium	LA-DEQ	1020	10013806
Boron	LA-DEQ	1025	10013806
Cadmium	LA-DEQ	1030	10013806
Calcium	LA-DEQ	1035	10013806
Chromium	LA-DEQ	1040	10013806
Cobalt	LA-DEQ	1050	10013806
Copper	LA-DEQ	1055	10013806
Iron	LA-DEQ	1070	10013806
Lead	LA-DEQ	1075	10013806
Lithium	LA-DEQ	1080	10013806
Magnesium	LA-DEQ	1085	10013806
Manganese	LA-DEQ	1090	10013806
Molybdenum	LA-DEQ	1100	10013806
Nickel	LA-DEQ	1105	10013806
Phosphorus	LA-DEQ	1910	10013806
Potassium	LA-DEQ	1125	10013806
Selenium	LA-DEQ	1140	10013806
Silica as SiO2	LA-DEQ	1990	10013806
Silver	LA-DEQ	1150	10013806
Sodium	LA-DEQ	1155	10013806
Strontium	LA-DEQ	1160	10013806
Thallium	LA-DEQ	1165	10013806

Matrix: *Non-Potable Water*

Tin	LA-DEQ	1175	10013806
Titanium	LA-DEQ	1180	10013806
Vanadium	LA-DEQ	1185	10013806
Zinc	LA-DEQ	1190	10013806

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	LA-DEQ	1000	10014605
Antimony	LA-DEQ	1005	10014605
Arsenic	LA-DEQ	1010	10014605
Barium	LA-DEQ	1015	10014605
Beryllium	LA-DEQ	1020	10014605
Boron	LA-DEQ	1025	10014605
Boron	LA-DEQ	1025	10014605
Cadmium	LA-DEQ	1030	10014605
Calcium	LA-DEQ	1035	10014605
Chromium	LA-DEQ	1040	10014605
Cobalt	LA-DEQ	1050	10014605
Copper	LA-DEQ	1055	10014605
Iron	LA-DEQ	1070	10014605
Lead	LA-DEQ	1075	10014605
Magnesium	LA-DEQ	1085	10014605
Manganese	LA-DEQ	1090	10014605
Molybdenum	LA-DEQ	1100	10014605
Nickel	LA-DEQ	1105	10014605
Potassium	LA-DEQ	1125	10014605
Selenium	LA-DEQ	1140	10014605
Silver	LA-DEQ	1150	10014605
Sodium	LA-DEQ	1155	10014605
Strontium	LA-DEQ	1160	10014605
Thallium	LA-DEQ	1165	10014605

Matrix: ***Non-Potable Water***

Thorium	LA-DEQ	1170	10014605
Tin	LA-DEQ	1175	10014605
Titanium	LA-DEQ	1180	10014605
Uranium	LA-DEQ	3035	10014605
Vanadium	LA-DEQ	1185	10014605
Zinc	LA-DEQ	1190	10014605

Method EPA 2000.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Acute toxicity	LA-DEQ	3300	10264809

Method EPA 2002.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Acute toxicity	LA-DEQ	3300	10214901

Method EPA 218.6

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	LA-DEQ	1045	10028009

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	LA-DEQ	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	LA-DEQ	1540	10053200
Chloride	LA-DEQ	1575	10053200
Fluoride	LA-DEQ	1730	10053200
Nitrate as N	LA-DEQ	1810	10053200
Nitrate-nitrite	LA-DEQ	1820	10053200
Nitrite as N	LA-DEQ	1840	10053200
Sulfate	LA-DEQ	2000	10053200

Method EPA 310.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	LA-DEQ	1505	10055206

Matrix: *Non-Potable Water*

Method EPA 314.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Perchlorate	LA-DEQ	1895	10277006

Method EPA 335.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	LA-DEQ	1645	10061402

Method EPA 350.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	LA-DEQ	1515	10063408

Method EPA 351.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	LA-DEQ	1790	10065404

Method EPA 353.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrate-nitrite	LA-DEQ	1820	10067400

Method EPA 365.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Phosphorus	LA-DEQ	1910	10070005

Method EPA 365.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	LA-DEQ	1870	10070403

Method EPA 365.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Phosphorus	LA-DEQ	1910	10071202

Method EPA 410.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	LA-DEQ	1565	10077404

Method EPA 420.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	LA-DEQ	1905	10079400

Method EPA 420.4

Analyte	**AB**	**Analyte ID**	**Method ID**

Matrix: ***Non-Potable Water***

Total phenolics	LA-DEQ	1905	10080203

Method EPA 6010

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	LA-DEQ	1000	10155201
Antimony	LA-DEQ	1005	10155201
Arsenic	LA-DEQ	1010	10155201
Barium	LA-DEQ	1015	10155201
Beryllium	LA-DEQ	1020	10155201
Boron	LA-DEQ	1025	10155201
Cadmium	LA-DEQ	1030	10155201
Calcium	LA-DEQ	1035	10155201
Chromium	LA-DEQ	1040	10155201
Cobalt	LA-DEQ	1050	10155201
Copper	LA-DEQ	1055	10155201
Iron	LA-DEQ	1070	10155201
Lead	LA-DEQ	1075	10155201
Lithium	LA-DEQ	1080	10155201
Magnesium	LA-DEQ	1085	10155201
Manganese	LA-DEQ	1090	10155201
Molybdenum	LA-DEQ	1100	10155201
Nickel	LA-DEQ	1105	10155201
Phosphorus	LA-DEQ	1910	10155201
Potassium	LA-DEQ	1125	10155201
Selenium	LA-DEQ	1140	10155201
Silver	LA-DEQ	1150	10155201
Sodium	LA-DEQ	1155	10155201
Strontium	LA-DEQ	1160	10155201
Thallium	LA-DEQ	1165	10155201
Tin	LA-DEQ	1175	10155201
Titanium	LA-DEQ	1180	10155201

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Matrix: ***Non-Potable Water***

Vanadium	LA-DEQ	1185	10155201
Zinc	LA-DEQ	1190	10155201

Method EPA 602

Analyte	AB	Analyte ID	Method ID
Benzene	LA-DEQ	4375	10102202
Ethylbenzene	LA-DEQ	4765	10102202
Methyl tert-butyl ether (MTBE)	LA-DEQ	5000	10102202
Toluene	LA-DEQ	5140	10102202
Xylene (total)	LA-DEQ	5260	10102202

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	LA-DEQ	1000	10156419
Antimony	LA-DEQ	1005	10156419
Arsenic	LA-DEQ	1010	10156419
Barium	LA-DEQ	1015	10156419
Beryllium	LA-DEQ	1020	10156419
Boron	LA-DEQ	1025	10156419
Cadmium	LA-DEQ	1030	10156419
Calcium	LA-DEQ	1035	10156419
Chromium	LA-DEQ	1040	10156419
Cobalt	LA-DEQ	1050	10156419
Copper	LA-DEQ	1055	10156419
Iron	LA-DEQ	1070	10156419
Lead	LA-DEQ	1075	10156419
Magnesium	LA-DEQ	1085	10156419
Manganese	LA-DEQ	1090	10156419
Molybdenum	LA-DEQ	1100	10156419
Nickel	LA-DEQ	1105	10156419
Potassium	LA-DEQ	1125	10156419
Selenium	LA-DEQ	1140	10156419
Silver	LA-DEQ	1150	10156419

Matrix: ***Non-Potable Water***

Sodium	LA-DEQ	1155	10156419
Strontium	LA-DEQ	1160	10156419
Thallium	LA-DEQ	1165	10156419
Tin	LA-DEQ	1175	10156419
Titanium	LA-DEQ	1180	10156419
Vanadium	LA-DEQ	1185	10156419
Zinc	LA-DEQ	1190	10156419

Method EPA 608.3

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	LA-DEQ	7355	10296625
4,4'-DDE	LA-DEQ	7360	10296625
4,4'-DDT	LA-DEQ	7365	10296625
Aldrin	LA-DEQ	7025	10296625
alpha-BHC (alpha-Hexachlorocyclohexane)	LA-DEQ	7110	10296625
alpha-Chlordane	LA-DEQ	7240	10296625
Aroclor-1016 (PCB-1016)	LA-DEQ	8880	10296625
Aroclor-1221 (PCB-1221)	LA-DEQ	8885	10296625
Aroclor-1232 (PCB-1232)	LA-DEQ	8890	10296625
Aroclor-1242 (PCB-1242)	LA-DEQ	8895	10296625
Aroclor-1248 (PCB-1248)	LA-DEQ	8900	10296625
Aroclor-1254 (PCB-1254)	LA-DEQ	8905	10296625
Aroclor-1260 (PCB-1260)	LA-DEQ	8910	10296625
beta-BHC (beta-Hexachlorocyclohexane)	LA-DEQ	7115	10296625
Chlordane (tech.)	LA-DEQ	7250	10296625
delta-BHC (delta-Hexachlorocyclohexane)	LA-DEQ	7105	10296625
Dieldrin	LA-DEQ	7470	10296625
Endosulfan I	LA-DEQ	7510	10296625
Endosulfan II	LA-DEQ	7515	10296625
Endosulfan sulfate	LA-DEQ	7520	10296625
Endrin	LA-DEQ	7540	10296625

Matrix: ***Non-Potable Water***

Endrin aldehyde	LA-DEQ	7530	10296625
Endrin ketone	LA-DEQ	7535	10296625
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	LA-DEQ	7120	10296625
gamma-Chlordane	LA-DEQ	7245	10296625
Heptachlor	LA-DEQ	7685	10296625
Heptachlor epoxide	LA-DEQ	7690	10296625
Methoxychlor	LA-DEQ	7810	10296625
Toxaphene (Chlorinated camphene)	LA-DEQ	8250	10296625

Method EPA 610

Analyte	AB	Analyte ID	Method ID
Acenaphthene	LA-DEQ	5500	10104402
Acenaphthylene	LA-DEQ	5505	10104402
Anthracene	LA-DEQ	5555	10104402
Benzo(a)anthracene	LA-DEQ	5575	10104402
Benzo(a)pyrene	LA-DEQ	5580	10104402
Benzo(b)fluoranthene	LA-DEQ	5585	10104402
Benzo(g,h,i)perylene	LA-DEQ	5590	10104402
Benzo(k)fluoranthene	LA-DEQ	5600	10104402
Chrysene	LA-DEQ	5855	10104402
Dibenz(a,h) anthracene	LA-DEQ	5895	10104402
Fluoranthene	LA-DEQ	6265	10104402
Fluorene	LA-DEQ	6270	10104402
Indeno(1,2,3-cd) pyrene	LA-DEQ	6315	10104402
Naphthalene	LA-DEQ	5005	10104402
Phenanthrene	LA-DEQ	6615	10104402
Pyrene	LA-DEQ	6665	10104402

Method EPA 624.1

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	LA-DEQ	5160	10298121
1,1,2,2-Tetrachloroethane	LA-DEQ	5110	10298121
1,1,2-Trichloroethane	LA-DEQ	5165	10298121

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Matrix: ***Non-Potable Water***

1,1-Dichloroethane	LA-DEQ	4630	10298121
1,1-Dichloroethylene	LA-DEQ	4640	10298121
1,2-Dibromoethane (EDB, Ethylene dibromide)	LA-DEQ	4585	10298121
1,2-Dichlorobenzene	LA-DEQ	4610	10298121
1,2-Dichloroethane (Ethylene dichloride)	LA-DEQ	4635	10298121
1,2-Dichloropropane	LA-DEQ	4655	10298121
1,3-Dichlorobenzene	LA-DEQ	4615	10298121
1,4-Dichlorobenzene	LA-DEQ	4620	10298121
2-Butanone (Methyl ethyl ketone, MEK)	LA-DEQ	4410	10298121
2-Chloroethyl vinyl ether	LA-DEQ	4500	10298121
Acetone (2-Propanone)	LA-DEQ	4315	10298121
Acrolein (Propenal)	LA-DEQ	4325	10298121
Acrylonitrile	LA-DEQ	4340	10298121
Benzene	LA-DEQ	4375	10298121
Bromodichloromethane	LA-DEQ	4395	10298121
Bromoform	LA-DEQ	4400	10298121
Carbon tetrachloride	LA-DEQ	4455	10298121
Chlorobenzene	LA-DEQ	4475	10298121
Chlorodibromomethane	LA-DEQ	4575	10298121
Chloroethane (Ethyl chloride)	LA-DEQ	4485	10298121
Chloroform	LA-DEQ	4505	10298121
cis-1,2-Dichloroethylene	LA-DEQ	4645	10298121
cis-1,3-Dichloropropene	LA-DEQ	4680	10298121
Ethylbenzene	LA-DEQ	4765	10298121
m+p-xylene	LA-DEQ	5240	10298121
Methyl bromide (Bromomethane)	LA-DEQ	4950	10298121
Methyl chloride (Chloromethane)	LA-DEQ	4960	10298121
Methyl tert-butyl ether (MTBE)	LA-DEQ	5000	10298121
Methylene chloride (Dichloromethane)	LA-DEQ	4975	10298121
Naphthalene	LA-DEQ	5005	10298121

Certificate: T104704245-19-16

Environmental Science Corp. dba: Pace Analytical National Center for Testing & Innovation

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Matrix: ***Non-Potable Water***

o-Xylene	LA-DEQ	5250	10298121
Tetrachloroethylene (Perchloroethylene)	LA-DEQ	5115	10298121
Toluene	LA-DEQ	5140	10298121
Total trihalomethanes	LA-DEQ	5205	10298121
trans-1,2-Dichloroethylene	LA-DEQ	4700	10298121
trans-1,3-Dichloropropylene	LA-DEQ	4685	10298121
Trichloroethene (Trichloroethylene)	LA-DEQ	5170	10298121
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	LA-DEQ	5175	10298121
Vinyl chloride	LA-DEQ	5235	10298121
Xylene (total)	LA-DEQ	5260	10298121

Method EPA 625.1

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	LA-DEQ	6715	10300024
1,2,4-Trichlorobenzene	LA-DEQ	5155	10300024
1,2-Dichlorobenzene	LA-DEQ	4610	10300024
1,2-Diphenylhydrazine	LA-DEQ	6221	10300024
1,3-Dichlorobenzene	LA-DEQ	4615	10300024
1,4-Dichlorobenzene	LA-DEQ	4620	10300024
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	LA-DEQ	4659	10300024
2,3,4,6-Tetrachlorophenol	LA-DEQ	6735	10300024
2,4,5-Trichlorophenol	LA-DEQ	6835	10300024
2,4,6-Trichlorophenol	LA-DEQ	6840	10300024
2,4-Dichlorophenol	LA-DEQ	6000	10300024
2,4-Dimethylphenol	LA-DEQ	6130	10300024
2,4-Dinitrophenol	LA-DEQ	6175	10300024
2,4-Dinitrotoluene (2,4-DNT)	LA-DEQ	6185	10300024
2,6-Dinitrotoluene (2,6-DNT)	LA-DEQ	6190	10300024
2-Chloronaphthalene	LA-DEQ	5795	10300024
2-Chlorophenol	LA-DEQ	5800	10300024
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	LA-DEQ	6360	10300024

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Matrix: ***Non-Potable Water***

2-Methylphenol (o-Cresol)	LA-DEQ	6400	10300024
2-Nitrophenol	LA-DEQ	6490	10300024
3,3'-Dichlorobenzidine	LA-DEQ	5945	10300024
4-Bromophenyl phenyl ether (BDE-3)	LA-DEQ	5660	10300024
4-Chloro-3-methylphenol	LA-DEQ	5700	10300024
4-Chlorophenyl phenylether	LA-DEQ	5825	10300024
4-Methylphenol (p-Cresol)	LA-DEQ	6410	10300024
4-Nitrophenol	LA-DEQ	6500	10300024
Acenaphthene	LA-DEQ	5500	10300024
Acenaphthylene	LA-DEQ	5505	10300024
Anthracene	LA-DEQ	5555	10300024
Benzidine	LA-DEQ	5595	10300024
Benzo(a)anthracene	LA-DEQ	5575	10300024
Benzo(a)pyrene	LA-DEQ	5580	10300024
Benzo(b)fluoranthene	LA-DEQ	5585	10300024
Benzo(g,h,i)perylene	LA-DEQ	5590	10300024
Benzo(k)fluoranthene	LA-DEQ	5600	10300024
bis(2-Chloroethoxy)methane	LA-DEQ	5760	10300024
bis(2-Chloroethyl) ether	LA-DEQ	5765	10300024
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	LA-DEQ	6065	10300024
Butyl benzyl phthalate	LA-DEQ	5670	10300024
Chrysene	LA-DEQ	5855	10300024
Dibenz(a,h) anthracene	LA-DEQ	5895	10300024
Diethyl phthalate	LA-DEQ	6070	10300024
Dimethyl phthalate	LA-DEQ	6135	10300024
Di-n-butyl phthalate	LA-DEQ	5925	10300024
Di-n-octyl phthalate	LA-DEQ	6200	10300024
Fluoranthene	LA-DEQ	6265	10300024
Fluorene	LA-DEQ	6270	10300024
Hexachlorobenzene	LA-DEQ	6275	10300024

Hexachlorobutadiene	LA-DEQ	4835	10300024
Hexachlorocyclopentadiene	LA-DEQ	6285	10300024
Hexachloroethane	LA-DEQ	4840	10300024
Indeno(1,2,3-cd) pyrene	LA-DEQ	6315	10300024
Isophorone	LA-DEQ	6320	10300024
Naphthalene	LA-DEQ	5005	10300024
Nitrobenzene	LA-DEQ	5015	10300024
n-Nitrosodiethylamine	LA-DEQ	6525	10300024
n-Nitrosodimethylamine	LA-DEQ	6530	10300024
n-Nitrosodi-n-butylamine	LA-DEQ	5025	10300024
n-Nitrosodi-n-propylamine	LA-DEQ	6545	10300024
n-Nitrosodiphenylamine	LA-DEQ	6535	10300024
Pentachlorobenzene	LA-DEQ	6590	10300024
Pentachlorophenol	LA-DEQ	6605	10300024
Phenanthrene	LA-DEQ	6615	10300024
Phenol	LA-DEQ	6625	10300024
Pyrene	LA-DEQ	6665	10300024
Pyridine	LA-DEQ	5095	10300024

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	LA-DEQ	1045	10162206

Method EPA 7199

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	LA-DEQ	1045	10163005

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	LA-DEQ	1095	10165603

Method EPA 8011

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2-Dibromo-3-chloropropane (DBCP)	LA-DEQ	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	LA-DEQ	4585	10173009

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NELAP - Recognized Laboratory Fields of Accreditation

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Matrix: ***Non-Potable Water***

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	LA-DEQ	9369	10173203
Ethanol	LA-DEQ	4750	10173203
Ethylene glycol	LA-DEQ	4785	10173203
Gasoline range organics (GRO)	LA-DEQ	9408	10173203
Methanol	LA-DEQ	4930	10173203
Propylene Glycol	LA-DEQ	6657	10173203

Method EPA 8021

Analyte	**AB**	**Analyte ID**	**Method ID**
Benzene	LA-DEQ	4375	10174400
Ethylbenzene	LA-DEQ	4765	10174400
m+p-xylene	LA-DEQ	5240	10174400
Methyl tert-butyl ether (MTBE)	LA-DEQ	5000	10174400
o-Xylene	LA-DEQ	5250	10174400
Toluene	LA-DEQ	5140	10174400
Xylene (total)	LA-DEQ	5260	10174400

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	LA-DEQ	7355	10178402
4,4'-DDE	LA-DEQ	7360	10178402
4,4'-DDT	LA-DEQ	7365	10178402
Aldrin	LA-DEQ	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	LA-DEQ	7110	10178402
alpha-Chlordane	LA-DEQ	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	LA-DEQ	7115	10178402
Chlordane (tech.)	LA-DEQ	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	LA-DEQ	7105	10178402
Dieldrin	LA-DEQ	7470	10178402
Endosulfan I	LA-DEQ	7510	10178402
Endosulfan II	LA-DEQ	7515	10178402

Matrix: ***Non-Potable Water***

Endosulfan sulfate	LA-DEQ	7520	10178402
Endrin	LA-DEQ	7540	10178402
Endrin aldehyde	LA-DEQ	7530	10178402
Endrin ketone	LA-DEQ	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	LA-DEQ	7120	10178402
gamma-Chlordane	LA-DEQ	7245	10178402
Heptachlor	LA-DEQ	7685	10178402
Heptachlor epoxide	LA-DEQ	7690	10178402
Hexachlorobenzene	LA-DEQ	6275	10178402
Methoxychlor	LA-DEQ	7810	10178402
Toxaphene (Chlorinated camphene)	LA-DEQ	8250	10178402

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	LA-DEQ	8880	10179007
Aroclor-1221 (PCB-1221)	LA-DEQ	8885	10179007
Aroclor-1232 (PCB-1232)	LA-DEQ	8890	10179007
Aroclor-1242 (PCB-1242)	LA-DEQ	8895	10179007
Aroclor-1248 (PCB-1248)	LA-DEQ	8900	10179007
Aroclor-1254 (PCB-1254)	LA-DEQ	8905	10179007
Aroclor-1260 (PCB-1260)	LA-DEQ	8910	10179007
PCBs (total)	LA-DEQ	8870	10179007

Method EPA 8141

Analyte	**AB**	**Analyte ID**	**Method ID**
Atrazine	LA-DEQ	7065	10181803
Azinphos-methyl (Guthion)	LA-DEQ	7075	10181803
Bolstar (Sulprofos)	LA-DEQ	7125	10181803
Carbophenothion	LA-DEQ	7220	10181803
Chlorpyrifos (Dursban)	LA-DEQ	7300	10181803
Coumaphos	LA-DEQ	7315	10181803
Demeton	LA-DEQ	7390	10181803
Demeton-o	LA-DEQ	7395	10181803

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Matrix: ***Non-Potable Water***

Demeton-s	LA-DEQ	7385	10181803
Diazinon	LA-DEQ	7410	10181803
Dichlorovos (DDVP, Dichlorvos)	LA-DEQ	8610	10181803
Dimethoate	LA-DEQ	7475	10181803
Disulfoton	LA-DEQ	8625	10181803
EPN (Phosphonothioic acid, phenyl-, O-ethyl O-(p-nitrophenyl) ester)	LA-DEQ	7550	10181803
Ethion	LA-DEQ	7565	10181803
Ethoprop	LA-DEQ	7570	10181803
Famphur	LA-DEQ	7580	10181803
Fensulfothion	LA-DEQ	7600	10181803
Fenthion	LA-DEQ	7605	10181803
Malathion	LA-DEQ	7770	10181803
Merphos	LA-DEQ	7785	10181803
Methyl parathion (Parathion, methyl)	LA-DEQ	7825	10181803
Mevinphos	LA-DEQ	7850	10181803
Naled	LA-DEQ	7905	10181803
Parathion, ethyl	LA-DEQ	7955	10181803
Phorate	LA-DEQ	7985	10181803
Phosmet (Imidan)	LA-DEQ	8000	10181803
Ronnel	LA-DEQ	8110	10181803
Sulfotepp	LA-DEQ	8155	10181803
Tetrachlorvinphos (Stirophos, Gardona)	LA-DEQ	8197	10181803
Tetraethyl pyrophosphate (TEPP)	LA-DEQ	8210	10181803
Tokuthion (Prothiophos)	LA-DEQ	8245	10181803
Trichloronate	LA-DEQ	8275	10181803

Method EPA 8151

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	LA-DEQ	8655	10183003
2,4-D	LA-DEQ	8545	10183003
2,4-DB	LA-DEQ	8560	10183003

Matrix: ***Non-Potable Water***

Dalapon	LA-DEQ	8555	10183003
Dicamba	LA-DEQ	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	LA-DEQ	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	LA-DEQ	8620	10183003
MCPA	LA-DEQ	7775	10183003
MCPP	LA-DEQ	7780	10183003
Pentachlorophenol	LA-DEQ	6605	10183003
Silvex (2,4,5-TP)	LA-DEQ	8650	10183003

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	LA-DEQ	5105	10184404
1,1,1-Trichloroethane	LA-DEQ	5160	10184404
1,1,2,2-Tetrachloroethane	LA-DEQ	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	LA-DEQ	5195	10184404
1,1,2-Trichloroethane	LA-DEQ	5165	10184404
1,1-Dichloroethane	LA-DEQ	4630	10184404
1,1-Dichloroethylene	LA-DEQ	4640	10184404
1,1-Dichloropropene	LA-DEQ	4670	10184404
1,2,3-Trichlorobenzene	LA-DEQ	5150	10184404
1,2,3-Trichloropropane	LA-DEQ	5180	10184404
1,2,4-Trichlorobenzene	LA-DEQ	5155	10184404
1,2,4-Trimethylbenzene	LA-DEQ	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	LA-DEQ	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	LA-DEQ	4585	10184404
1,2-Dichlorobenzene	LA-DEQ	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	LA-DEQ	4635	10184404
1,2-Dichloropropane	LA-DEQ	4655	10184404
1,3,5-Trimethylbenzene	LA-DEQ	5215	10184404
1,3-Dichlorobenzene	LA-DEQ	4615	10184404
1,3-Dichloropropane	LA-DEQ	4660	10184404

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Matrix: ***Non-Potable Water***

1,4-Dichlorobenzene	LA-DEQ	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	LA-DEQ	4735	10184404
2,2-Dichloropropane	LA-DEQ	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	LA-DEQ	4410	10184404
2-Chloroethyl vinyl ether	LA-DEQ	4500	10184404
2-Chlorotoluene	LA-DEQ	4535	10184404
2-Hexanone (MBK)	LA-DEQ	4860	10184404
2-Nitropropane	LA-DEQ	5020	10184404
4-Chlorotoluene	LA-DEQ	4540	10184404
4-Isopropyltoluene (p-Cymene)	LA-DEQ	4915	10184404
4-Methyl-2-pentanone (MIBK)	LA-DEQ	4995	10184404
Acetone (2-Propanone)	LA-DEQ	4315	10184404
Acetonitrile	LA-DEQ	4320	10184404
Acrolein (Propenal)	LA-DEQ	4325	10184404
Acrylonitrile	LA-DEQ	4340	10184404
Allyl chloride (3-Chloropropene)	LA-DEQ	4355	10184404
Benzene	LA-DEQ	4375	10184404
Bromobenzene	LA-DEQ	4385	10184404
Bromochloromethane	LA-DEQ	4390	10184404
Bromodichloromethane	LA-DEQ	4395	10184404
Bromoform	LA-DEQ	4400	10184404
Carbon disulfide	LA-DEQ	4450	10184404
Carbon tetrachloride	LA-DEQ	4455	10184404
Chlorobenzene	LA-DEQ	4475	10184404
Chlorodibromomethane	LA-DEQ	4575	10184404
Chloroethane (Ethyl chloride)	LA-DEQ	4485	10184404
Chloroform	LA-DEQ	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	LA-DEQ	4525	10184404
cis-1,2-Dichloroethylene	LA-DEQ	4645	10184404
cis-1,3-Dichloropropene	LA-DEQ	4680	10184404

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Matrix: ***Non-Potable Water***

cis-1,4-Dichloro-2-butene	LA-DEQ	4600	10184404
Dibromomethane (Methylene bromide)	LA-DEQ	4595	10184404
Dichlorodifluoromethane (Freon-12)	LA-DEQ	4625	10184404
Diethyl ether	LA-DEQ	4725	10184404
Di-isopropylether (DIPE)	LA-DEQ	9375	10184404
Ethanol	LA-DEQ	4750	10184404
Ethyl acetate	LA-DEQ	4755	10184404
Ethyl methacrylate	LA-DEQ	4810	10184404
Ethylbenzene	LA-DEQ	4765	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	LA-DEQ	4770	10184404
Hexachlorobutadiene	LA-DEQ	4835	10184404
Hexachloroethane	LA-DEQ	4840	10184404
Iodomethane (Methyl iodide)	LA-DEQ	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	LA-DEQ	4875	10184404
Isopropyl alcohol (2-Propanol, Isopropanol)	LA-DEQ	4895	10184404
Isopropylbenzene (Cumene)	LA-DEQ	4900	10184404
m+p-xylene	LA-DEQ	5240	10184404
Methacrylonitrile	LA-DEQ	4925	10184404
Methanol	LA-DEQ	4930	10184404
Methyl acetate	LA-DEQ	4940	10184404
Methyl acrylate	LA-DEQ	4945	10184404
Methyl bromide (Bromomethane)	LA-DEQ	4950	10184404
Methyl chloride (Chloromethane)	LA-DEQ	4960	10184404
Methyl methacrylate	LA-DEQ	4990	10184404
Methyl tert-butyl ether (MTBE)	LA-DEQ	5000	10184404
Methylcyclohexane	LA-DEQ	4965	10184404
Methylene chloride (Dichloromethane)	LA-DEQ	4975	10184404
Naphthalene	LA-DEQ	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	LA-DEQ	4425	10184404
n-Butylbenzene	LA-DEQ	4435	10184404

Matrix: ***Non-Potable Water***

n-Propylbenzene	LA-DEQ	5090	10184404
o-Xylene	LA-DEQ	5250	10184404
Pentachloroethane	LA-DEQ	5035	10184404
Propionitrile (Ethyl cyanide)	LA-DEQ	5080	10184404
sec-Butylbenzene	LA-DEQ	4440	10184404
Styrene	LA-DEQ	5100	10184404
T-amylmethylether (TAME)	LA-DEQ	4370	10184404
tert-Butyl alcohol	LA-DEQ	4420	10184404
tert-Butylbenzene	LA-DEQ	4445	10184404
Tetrachloroethylene (Perchloroethylene)	LA-DEQ	5115	10184404
Toluene	LA-DEQ	5140	10184404
trans-1,2-Dichloroethylene	LA-DEQ	4700	10184404
trans-1,3-Dichloropropylene	LA-DEQ	4685	10184404
trans-1,4-Dichloro-2-butene	LA-DEQ	4605	10184404
Trichloroethene (Trichloroethylene)	LA-DEQ	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	LA-DEQ	5175	10184404
Vinyl acetate	LA-DEQ	5225	10184404
Vinyl chloride	LA-DEQ	5235	10184404
Xylene (total)	LA-DEQ	5260	10184404

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	LA-DEQ	6715	10185203
1,2,4-Trichlorobenzene	LA-DEQ	5155	10185203
1,2-Dichlorobenzene	LA-DEQ	4610	10185203
1,2-Diphenylhydrazine	LA-DEQ	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	LA-DEQ	6885	10185203
1,3-Dichlorobenzene	LA-DEQ	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	LA-DEQ	6160	10185203
1,4-Dichlorobenzene	LA-DEQ	4620	10185203
1,4-Naphthoquinone	LA-DEQ	6420	10185203

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Matrix: ***Non-Potable Water***

1,4-Phenylenediamine	LA-DEQ	6630	10185203
1-Chloronaphthalene	LA-DEQ	5790	10185203
1-Naphthylamine	LA-DEQ	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	LA-DEQ	4659	10185203
2,3,4,6-Tetrachlorophenol	LA-DEQ	6735	10185203
2,4,5-Trichlorophenol	LA-DEQ	6835	10185203
2,4,6-Trichlorophenol	LA-DEQ	6840	10185203
2,4-Dichlorophenol	LA-DEQ	6000	10185203
2,4-Dimethylphenol	LA-DEQ	6130	10185203
2,4-Dinitrophenol	LA-DEQ	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	LA-DEQ	6185	10185203
2,6-Dichlorophenol	LA-DEQ	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	LA-DEQ	6190	10185203
2-Acetylaminofluorene	LA-DEQ	5515	10185203
2-Chloronaphthalene	LA-DEQ	5795	10185203
2-Chlorophenol	LA-DEQ	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	LA-DEQ	6360	10185203
2-Methylaniline (o-Toluidine)	LA-DEQ	5145	10185203
2-Methylnaphthalene	LA-DEQ	6385	10185203
2-Methylphenol (o-Cresol)	LA-DEQ	6400	10185203
2-Naphthylamine	LA-DEQ	6430	10185203
2-Nitroaniline	LA-DEQ	6460	10185203
2-Nitrophenol	LA-DEQ	6490	10185203
2-Picoline (2-Methylpyridine)	LA-DEQ	5050	10185203
3,3'-Dichlorobenzidine	LA-DEQ	5945	10185203
3,3'-Dimethylbenzidine	LA-DEQ	6120	10185203
3-Methylcholanthrene	LA-DEQ	6355	10185203
3-Methylphenol (m-Cresol)	LA-DEQ	6405	10185203
3-Nitroaniline	LA-DEQ	6465	10185203
4,4'-Methylenebis(2-chloroaniline)	LA-DEQ	6365	10185203

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Matrix: ***Non-Potable Water***

4-Aminobiphenyl	LA-DEQ	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	LA-DEQ	5660	10185203
4-Chloro-3-methylphenol	LA-DEQ	5700	10185203
4-Chloroaniline	LA-DEQ	5745	10185203
4-Chlorophenyl phenylether	LA-DEQ	5825	10185203
4-Methylphenol (p-Cresol)	LA-DEQ	6410	10185203
4-Nitroaniline	LA-DEQ	6470	10185203
4-Nitrophenol	LA-DEQ	6500	10185203
4-Nitroquinoline-1-oxide	LA-DEQ	6510	10185203
5-Nitro-o-toluidine	LA-DEQ	6570	10185203
7,12-Dimethylbenz(a) anthracene	LA-DEQ	6115	10185203
a-a-Dimethylphenethylamine	LA-DEQ	6125	10185203
Acenaphthene	LA-DEQ	5500	10185203
Acenaphthylene	LA-DEQ	5505	10185203
Acetophenone	LA-DEQ	5510	10185203
Aniline	LA-DEQ	5545	10185203
Anthracene	LA-DEQ	5555	10185203
Aramite	LA-DEQ	5560	10185203
Atrazine	LA-DEQ	7065	10185203
Benzenethiol (Thiophenol)	LA-DEQ	6750	10185203
Benzidine	LA-DEQ	5595	10185203
Benzo(a)anthracene	LA-DEQ	5575	10185203
Benzo(a)pyrene	LA-DEQ	5580	10185203
Benzo(b)fluoranthene	LA-DEQ	5585	10185203
Benzo(g,h,i)perylene	LA-DEQ	5590	10185203
Benzo(k)fluoranthene	LA-DEQ	5600	10185203
Benzoic acid	LA-DEQ	5610	10185203
Benzyl alcohol	LA-DEQ	5630	10185203
Biphenyl	LA-DEQ	5640	10185203
bis(2-Chloroethoxy)methane	LA-DEQ	5760	10185203

Matrix: ***Non-Potable Water***

bis(2-Chloroethyl) ether	LA-DEQ	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	LA-DEQ	6065	10185203
Butyl benzyl phthalate	LA-DEQ	5670	10185203
Caprolactam	LA-DEQ	7180	10185203
Carbazole	LA-DEQ	5680	10185203
Chlorobenzilate	LA-DEQ	7260	10185203
Chrysene	LA-DEQ	5855	10185203
Diallate	LA-DEQ	7405	10185203
Dibenz(a,h) anthracene	LA-DEQ	5895	10185203
Dibenz(a,j) acridine	LA-DEQ	5900	10185203
Dibenzo(a,e) pyrene	LA-DEQ	5890	10185203
Dibenzofuran	LA-DEQ	5905	10185203
Diethyl phthalate	LA-DEQ	6070	10185203
Dimethoate	LA-DEQ	7475	10185203
Dimethyl phthalate	LA-DEQ	6135	10185203
Di-n-butyl phthalate	LA-DEQ	5925	10185203
Di-n-octyl phthalate	LA-DEQ	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	LA-DEQ	8620	10185203
Diphenylamine	LA-DEQ	6205	10185203
Disulfoton	LA-DEQ	8625	10185203
Ethyl methanesulfonate	LA-DEQ	6260	10185203
Famphur	LA-DEQ	7580	10185203
Fluoranthene	LA-DEQ	6265	10185203
Fluorene	LA-DEQ	6270	10185203
Hexachlorobenzene	LA-DEQ	6275	10185203
Hexachlorobutadiene	LA-DEQ	4835	10185203
Hexachlorocyclopentadiene	LA-DEQ	6285	10185203
Hexachloroethane	LA-DEQ	4840	10185203
Hexachlorophene	LA-DEQ	6290	10185203
Hexachloropropene	LA-DEQ	6295	10185203

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Matrix: ***Non-Potable Water***

Indeno(1,2,3-cd) pyrene	LA-DEQ	6315	10185203
Isodrin	LA-DEQ	7725	10185203
Isophorone	LA-DEQ	6320	10185203
Isosafrole	LA-DEQ	6325	10185203
Kepone	LA-DEQ	7740	10185203
Methapyrilene	LA-DEQ	6345	10185203
Methyl methanesulfonate	LA-DEQ	6375	10185203
Methyl parathion (Parathion, methyl)	LA-DEQ	7825	10185203
Naphthalene	LA-DEQ	5005	10185203
Nitrobenzene	LA-DEQ	5015	10185203
n-Nitrosodiethylamine	LA-DEQ	6525	10185203
n-Nitrosodimethylamine	LA-DEQ	6530	10185203
n-Nitrosodi-n-butylamine	LA-DEQ	5025	10185203
n-Nitrosodi-n-propylamine	LA-DEQ	6545	10185203
n-Nitrosodiphenylamine	LA-DEQ	6535	10185203
n-Nitrosomethylethylamine	LA-DEQ	6550	10185203
n-Nitrosomorpholine	LA-DEQ	6555	10185203
n-Nitrosopiperidine	LA-DEQ	6560	10185203
n-Nitrosopyrrolidine	LA-DEQ	6565	10185203
o,o,o-Triethyl phosphorothioate	LA-DEQ	8290	10185203
Parathion, ethyl	LA-DEQ	7955	10185805
Pentachlorobenzene	LA-DEQ	6590	10185203
Pentachloronitrobenzene (PCNB)	LA-DEQ	6600	10185203
Pentachlorophenol	LA-DEQ	6605	10185203
Phenacetin	LA-DEQ	6610	10185203
Phenanthrene	LA-DEQ	6615	10185203
Phenol	LA-DEQ	6625	10185203
Phorate	LA-DEQ	7985	10185203
Phthalic anhydride	LA-DEQ	6640	10185203
Pronamide (Kerb)	LA-DEQ	6650	10185203

Matrix: ***Non-Potable Water***

Pyrene	LA-DEQ	6665	10185203
Pyridine	LA-DEQ	5095	10185203
Quinoline	LA-DEQ	6670	10185203
Safrole	LA-DEQ	6685	10185203
Sulfotepp	LA-DEQ	8155	10185203
Thionazin (Zinophos)	LA-DEQ	8235	10185203
tris-(2,3-Dibromopropyl) phosphate (tris-BP)	LA-DEQ	8310	10185203

Method EPA 8310

Analyte	AB	Analyte ID	Method ID
Acenaphthene	LA-DEQ	5500	10187607
Acenaphthylene	LA-DEQ	5505	10187607
Anthracene	LA-DEQ	5555	10187607
Benzo(a)anthracene	LA-DEQ	5575	10187607
Benzo(a)pyrene	LA-DEQ	5580	10187607
Benzo(b)fluoranthene	LA-DEQ	5585	10187607
Benzo(g,h,i)perylene	LA-DEQ	5590	10187607
Benzo(k)fluoranthene	LA-DEQ	5600	10187607
Chrysene	LA-DEQ	5855	10187607
Dibenz(a,h) anthracene	LA-DEQ	5895	10187607
Fluoranthene	LA-DEQ	6265	10187607
Fluorene	LA-DEQ	6270	10187607
Indeno(1,2,3-cd) pyrene	LA-DEQ	6315	10187607
Naphthalene	LA-DEQ	5005	10187607
Phenanthrene	LA-DEQ	6615	10187607
Pyrene	LA-DEQ	6665	10187607

Method EPA 8330

Analyte	AB	Analyte ID	Method ID
1,3,5-Trinitrobenzene (1,3,5-TNB)	LA-DEQ	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	LA-DEQ	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	LA-DEQ	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	LA-DEQ	6185	10189807

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Matrix: ***Non-Potable Water***

2,6-Dinitrotoluene (2,6-DNT)	LA-DEQ	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	LA-DEQ	9303	10189807
2-Nitrotoluene	LA-DEQ	9507	10189807
3-Nitrotoluene	LA-DEQ	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	LA-DEQ	9306	10189807
4-Nitrotoluene	LA-DEQ	9513	10189807
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	LA-DEQ	6415	10189807
Nitrobenzene	LA-DEQ	5015	10189807
Nitroglycerin	LA-DEQ	6485	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	LA-DEQ	9522	10189807
Pentaerythritoltetranitrate (PETN)	LA-DEQ	9558	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	LA-DEQ	9432	10189807

Method EPA 900.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Gross-alpha	LA-DEQ	2830	10308200
Gross-beta	LA-DEQ	2840	10308200

Method EPA 9012

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	LA-DEQ	1510	10193405
Total cyanide	LA-DEQ	1645	10193405

Method EPA 9020

Analyte	**AB**	**Analyte ID**	**Method ID**
Total organic halides (TOX)	LA-DEQ	2045	10194000

Method EPA 903.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Total radium	LA-DEQ	2975	10309407

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	LA-DEQ	1900	10196802

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**

Matrix: ***Non-Potable Water***

Conductivity	LA-DEQ	1610	10198604

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	LA-DEQ	1540	10199209
Chloride	LA-DEQ	1575	10199209
Fluoride	LA-DEQ	1730	10199209
Nitrate as N	LA-DEQ	1810	10199209
Nitrate-nitrite	LA-DEQ	1820	10199209
Nitrite as N	LA-DEQ	1840	10199209
Sulfate	LA-DEQ	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	LA-DEQ	2040	10200201

Method EPA 9066

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	LA-DEQ	1905	10200609

Method EPA RSK 175

Analyte	**AB**	**Analyte ID**	**Method ID**
Ethane	LA-DEQ	4747	10212905
Ethene	LA-DEQ	4752	10212905
Methane	LA-DEQ	4926	10212905
n-Propane	LA-DEQ	5029	10212905

Method SM 2120 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Color	LA-DEQ	1605	20223807

Method SM 2130 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	LA-DEQ	2055	20042200

Method SM 2310 B (4a)

Analyte	**AB**	**Analyte ID**	**Method ID**
Acidity, as CaCO3	LA-DEQ	1500	20002806

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Matrix: ***Non-Potable Water***

Method SM 2320 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	LA-DEQ	1505	20045005

Method SM 2340 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total hardness as CaCO3	LA-DEQ	1755	20046008

Method SM 2340 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total hardness as CaCO3	LA-DEQ	1755	20047001

Method SM 2510 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	LA-DEQ	1610	20048004

Method SM 2540 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	LA-DEQ	1950	20004608

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	LA-DEQ	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	LA-DEQ	1960	20004802

Method SM 2540 F

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-settleable	LA-DEQ	1965	20005009

Method SM 3500-Cr B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	LA-DEQ	1045	20065809

Method SM 3500-Cr C

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	LA-DEQ	1045	20066404

Method SM 3500-Fe B

Analyte	**AB**	**Analyte ID**	**Method ID**

Matrix: *Non-Potable Water*

Iron	LA-DEQ	1070	20068604

Method SM 4110 B

Analyte	AB	Analyte ID	Method ID
Chloride	LA-DEQ	1575	20076408
Fluoride	LA-DEQ	1730	20076408
Nitrate as N	LA-DEQ	1810	20076408
Nitrate-nitrite	LA-DEQ	1820	20076408
Nitrite as N	LA-DEQ	1840	20076408
Sulfate	LA-DEQ	2000	20076408

Method SM 4500-Cl G

Analyte	AB	Analyte ID	Method ID
Total residual chlorine	LA-DEQ	1940	20020604

Method SM 4500-CN$^-$ C

Analyte	AB	Analyte ID	Method ID
Total cyanide	LA-DEQ	1645	20020808

Method SM 4500-CN$^-$ E

Analyte	AB	Analyte ID	Method ID
Total cyanide	LA-DEQ	1645	20021209

Method SM 4500-CN$^-$ G

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	LA-DEQ	1510	20021607

Method SM 4500-F$^-$ C

Analyte	AB	Analyte ID	Method ID
Fluoride	LA-DEQ	1730	20101808

Method SM 4500-H+ B

Analyte	AB	Analyte ID	Method ID
pH	LA-DEQ	1900	20104603

Method SM 4500-NH3 C

Analyte	AB	Analyte ID	Method ID
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	LA-DEQ	1790	20023603

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Matrix: ***Non-Potable Water***

Method SM 4500-NH3 G

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	LA-DEQ	1515	20023205

Method SM 4500-NO3 F

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrate-nitrite	LA-DEQ	1820	20024402

Method SM 4500-O C

Analyte	**AB**	**Analyte ID**	**Method ID**
Oxygen, dissolved	LA-DEQ	1880	20025201

Method SM 4500-O G

Analyte	**AB**	**Analyte ID**	**Method ID**
Oxygen, dissolved	LA-DEQ	1880	20025405

Method SM 4500-P E

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	LA-DEQ	1870	20025803

Method SM 4500-S2¯ D

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	LA-DEQ	2005	20125400

Method SM 4500-SO3¯ B

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfite	LA-DEQ	2015	20026806

Method SM 5210 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Biochemical oxygen demand (BOD)	LA-DEQ	1530	20027401
Carbonaceous BOD, CBOD	LA-DEQ	1555	20027401

Method SM 5220 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	LA-DEQ	1565	20027809

Method SM 5310 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	LA-DEQ	2040	20137206

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Matrix: ***Non-Potable Water***

Method SM 5540 C

Analyte	AB	Analyte ID	Method ID
Surfactants - MBAS	LA-DEQ	2025	20144405

Method SM 6200 B

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	LA-DEQ	5160	20146605
1,1,2,2-Tetrachloroethane	LA-DEQ	5110	20146605
1,1,2-Trichloroethane	LA-DEQ	5165	20146605
1,1-Dichloroethane	LA-DEQ	4630	20146605
1,1-Dichloroethylene	LA-DEQ	4640	20146605
1,2-Dichlorobenzene	LA-DEQ	4610	20146605
1,2-Dichloroethane (Ethylene dichloride)	LA-DEQ	4635	20146605
1,2-Dichloropropane	LA-DEQ	4655	20146605
1,3-Dichlorobenzene	LA-DEQ	4615	20146605
1,4-Dichlorobenzene	LA-DEQ	4620	20146605
2-Chloroethyl vinyl ether	LA-DEQ	4500	20146605
Benzene	LA-DEQ	4375	20146605
Bromodichloromethane	LA-DEQ	4395	20146605
Bromoform	LA-DEQ	4400	20146605
Chlorobenzene	LA-DEQ	4475	20146605
Chlorodibromomethane	LA-DEQ	4575	20146605
Chloroethane (Ethyl chloride)	LA-DEQ	4485	20146605
Chloroform	LA-DEQ	4505	20146605
cis-1,3-Dichloropropene	LA-DEQ	4680	20146605
Ethylbenzene	LA-DEQ	4765	20146605
Methyl bromide (Bromomethane)	LA-DEQ	4950	20146605
Methyl chloride (Chloromethane)	LA-DEQ	4960	20146605
Tetrachloroethylene (Perchloroethylene)	LA-DEQ	5115	20146605
Toluene	LA-DEQ	5140	20146605
trans-1,2-Dichloroethylene	LA-DEQ	4700	20146605
trans-1,3-Dichloropropylene	LA-DEQ	4685	20146605

Matrix: ***Non-Potable Water***

Trichloroethene (Trichloroethylene)	LA-DEQ	5170	20146605
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	LA-DEQ	5175	20146605
Vinyl chloride	LA-DEQ	5235	20146605

Method SM 6640 B

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	LA-DEQ	8655	20031407
2,4-D	LA-DEQ	8545	20031407
Silvex (2,4,5-TP)	LA-DEQ	8650	20031407

Method SM 7500 Ra B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total radium	LA-DEQ	2975	20170007

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	LA-DEQ	2050	90019208

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Matrix: ***Solid & Chemical Materials***

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	LA-DEQ	1780	10116606

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	LA-DEQ	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	LA-DEQ	850	10119003

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	LA-DEQ	1540	10053200
Chloride	LA-DEQ	1575	10053200
Fluoride	LA-DEQ	1730	10053200
Nitrate as N	LA-DEQ	1810	10053200
Nitrate-nitrite	LA-DEQ	1820	10053200
Nitrite as N	LA-DEQ	1840	10053200
Orthophosphate as P	LA-DEQ	1870	10053200
Sulfate	LA-DEQ	2000	10053200

Method EPA 314.0

Analyte	AB	Analyte ID	Method ID
Perchlorate	LA-DEQ	1895	10277006

Method EPA 350.1

Analyte	AB	Analyte ID	Method ID
Ammonia as N	LA-DEQ	1515	10063408

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	LA-DEQ	1000	10155201
Antimony	LA-DEQ	1005	10155201
Arsenic	LA-DEQ	1010	10155201
Barium	LA-DEQ	1015	10155201

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Matrix: ***Solid & Chemical Materials***

Beryllium	LA-DEQ	1020	10155201
Boron	LA-DEQ	1025	10155201
Cadmium	LA-DEQ	1030	10155201
Calcium	LA-DEQ	1035	10155201
Chromium	LA-DEQ	1040	10155201
Cobalt	LA-DEQ	1050	10155201
Copper	LA-DEQ	1055	10155201
Iron	LA-DEQ	1070	10155201
Lead	LA-DEQ	1075	10155201
Lithium	LA-DEQ	1080	10155201
Magnesium	LA-DEQ	1085	10155201
Manganese	LA-DEQ	1090	10155201
Molybdenum	LA-DEQ	1100	10155201
Nickel	LA-DEQ	1105	10155201
Phosphorus	LA-DEQ	1910	10155201
Potassium	LA-DEQ	1125	10155201
Selenium	LA-DEQ	1140	10155201
Silver	LA-DEQ	1150	10155201
Sodium	LA-DEQ	1155	10155201
Strontium	LA-DEQ	1160	10155201
Thallium	LA-DEQ	1165	10155201
Tin	LA-DEQ	1175	10155201
Titanium	LA-DEQ	1180	10155201
Vanadium	LA-DEQ	1185	10155201
Zinc	LA-DEQ	1190	10155201

Method EPA 6020

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	LA-DEQ	1000	10156419
Antimony	LA-DEQ	1005	10156419
Arsenic	LA-DEQ	1010	10156419

Matrix: ***Solid & Chemical Materials***

Barium	LA-DEQ	1015	10156419
Beryllium	LA-DEQ	1020	10156419
Boron	LA-DEQ	1025	10156419
Cadmium	LA-DEQ	1030	10156419
Calcium	LA-DEQ	1035	10156419
Chromium	LA-DEQ	1040	10156419
Cobalt	LA-DEQ	1050	10156419
Copper	LA-DEQ	1055	10156419
Iron	LA-DEQ	1070	10156419
Lead	LA-DEQ	1075	10156419
Magnesium	LA-DEQ	1085	10156419
Manganese	LA-DEQ	1090	10156419
Molybdenum	LA-DEQ	1100	10156419
Nickel	LA-DEQ	1105	10156419
Potassium	LA-DEQ	1125	10156419
Selenium	LA-DEQ	1140	10156419
Silver	LA-DEQ	1150	10156419
Sodium	LA-DEQ	1155	10156419
Strontium	LA-DEQ	1160	10156419
Thallium	LA-DEQ	1165	10156419
Tin	LA-DEQ	1175	10156419
Titanium	LA-DEQ	1180	10156419
Vanadium	LA-DEQ	1185	10156419
Zinc	LA-DEQ	1190	10156419

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	LA-DEQ	1045	10162206

Method EPA 7199

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	LA-DEQ	1045	10163005

Matrix: ***Solid & Chemical Materials***

Method EPA 7471

Analyte	AB	Analyte ID	Method ID
Mercury	LA-DEQ	1095	10166004

Method EPA 8015

Analyte	AB	Analyte ID	Method ID
Diesel range organics (DRO)	LA-DEQ	9369	10173203
Ethanol	LA-DEQ	4750	10173203
Ethylene glycol	LA-DEQ	4785	10173203
Gasoline range organics (GRO)	LA-DEQ	9408	10173203
Methanol	LA-DEQ	4930	10173203
Propylene Glycol	LA-DEQ	6657	10173203

Method EPA 8021

Analyte	AB	Analyte ID	Method ID
Benzene	LA-DEQ	4375	10174400
Ethylbenzene	LA-DEQ	4765	10174400
m+p-xylene	LA-DEQ	5240	10174400
Methyl tert-butyl ether (MTBE)	LA-DEQ	5000	10174400
o-Xylene	LA-DEQ	5250	10174400
Toluene	LA-DEQ	5140	10174400
Xylene (total)	LA-DEQ	5260	10174400

Method EPA 8081

Analyte	AB	Analyte ID	Method ID
4,4'-DDD	LA-DEQ	7355	10178402
4,4'-DDE	LA-DEQ	7360	10178402
4,4'-DDT	LA-DEQ	7365	10178402
Aldrin	LA-DEQ	7025	10178402
alpha-BHC (alpha-Hexachlorocyclohexane)	LA-DEQ	7110	10178402
alpha-Chlordane	LA-DEQ	7240	10178402
beta-BHC (beta-Hexachlorocyclohexane)	LA-DEQ	7115	10178402
Chlordane (tech.)	LA-DEQ	7250	10178402
delta-BHC (delta-Hexachlorocyclohexane)	LA-DEQ	7105	10178402

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Matrix: ***Solid & Chemical Materials***

Dieldrin	LA-DEQ	7470	10178402
Endosulfan I	LA-DEQ	7510	10178402
Endosulfan II	LA-DEQ	7515	10178402
Endosulfan sulfate	LA-DEQ	7520	10178402
Endrin	LA-DEQ	7540	10178402
Endrin aldehyde	LA-DEQ	7530	10178402
Endrin ketone	LA-DEQ	7535	10178402
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	LA-DEQ	7120	10178402
gamma-Chlordane	LA-DEQ	7245	10178402
Heptachlor	LA-DEQ	7685	10178402
Heptachlor epoxide	LA-DEQ	7690	10178402
Hexachlorobenzene	LA-DEQ	6275	10178402
Methoxychlor	LA-DEQ	7810	10178402
Toxaphene (Chlorinated camphene)	LA-DEQ	8250	10178402

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	LA-DEQ	8880	10179007
Aroclor-1221 (PCB-1221)	LA-DEQ	8885	10179007
Aroclor-1232 (PCB-1232)	LA-DEQ	8890	10179007
Aroclor-1242 (PCB-1242)	LA-DEQ	8895	10179007
Aroclor-1248 (PCB-1248)	LA-DEQ	8900	10179007
Aroclor-1254 (PCB-1254)	LA-DEQ	8905	10179007
Aroclor-1260 (PCB-1260)	LA-DEQ	8910	10179007

Method EPA 8141

Analyte	**AB**	**Analyte ID**	**Method ID**
Azinphos-methyl (Guthion)	LA-DEQ	7075	10181803
Bolstar (Sulprofos)	LA-DEQ	7125	10181803
Chlorpyrifos (Dursban)	LA-DEQ	7300	10181803
Coumaphos	LA-DEQ	7315	10181803
Demeton	LA-DEQ	7390	10181803
Demeton-o	LA-DEQ	7395	10181803

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Matrix: ***Solid & Chemical Materials***

Demeton-s	LA-DEQ	7385	10181803
Diazinon	LA-DEQ	7410	10181803
Dichlorovos (DDVP, Dichlorvos)	LA-DEQ	8610	10181803
Dimethoate	LA-DEQ	7475	10181803
Disulfoton	LA-DEQ	8625	10181803
EPN (Phosphonothioic acid, phenyl-, O-ethyl O-(p-nitrophenyl) ester)	LA-DEQ	7550	10181803
Ethoprop	LA-DEQ	7570	10181803
Fensulfothion	LA-DEQ	7600	10181803
Fenthion	LA-DEQ	7605	10181803
Malathion	LA-DEQ	7770	10181803
Merphos	LA-DEQ	7785	10181803
Methyl parathion (Parathion, methyl)	LA-DEQ	7825	10181803
Mevinphos	LA-DEQ	7850	10181803
Naled	LA-DEQ	7905	10181803
Parathion, ethyl	LA-DEQ	7955	10182000
Phorate	LA-DEQ	7985	10181803
Ronnel	LA-DEQ	8110	10181803
Sulfotepp	LA-DEQ	8155	10181803
Tetrachlorvinphos (Stirophos, Gardona)	LA-DEQ	8197	10181803
Tetraethyl pyrophosphate (TEPP)	LA-DEQ	8210	10181803
Tokuthion (Prothiophos)	LA-DEQ	8245	10181803
Trichloronate	LA-DEQ	8275	10181803

Method EPA 8151

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	LA-DEQ	8655	10183003
2,4-D	LA-DEQ	8545	10183003
2,4-DB	LA-DEQ	8560	10183003
Dalapon	LA-DEQ	8555	10183003
Dicamba	LA-DEQ	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	LA-DEQ	8605	10183003

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Matrix: ***Solid & Chemical Materials***

Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	LA-DEQ	8620	10183003
MCPA	LA-DEQ	7775	10183003
MCPP	LA-DEQ	7780	10183003
Pentachlorophenol	LA-DEQ	6605	10183003
Silvex (2,4,5-TP)	LA-DEQ	8650	10183003

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	LA-DEQ	5105	10184404
1,1,1-Trichloroethane	LA-DEQ	5160	10184404
1,1,2,2-Tetrachloroethane	LA-DEQ	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	LA-DEQ	5195	10184404
1,1,2-Trichloroethane	LA-DEQ	5165	10184404
1,1-Dichloroethane	LA-DEQ	4630	10184404
1,1-Dichloroethylene	LA-DEQ	4640	10184404
1,1-Dichloropropene	LA-DEQ	4670	10184404
1,2,3-Trichlorobenzene	LA-DEQ	5150	10184404
1,2,3-Trichloropropane	LA-DEQ	5180	10184404
1,2,4-Trichlorobenzene	LA-DEQ	5155	10184404
1,2,4-Trimethylbenzene	LA-DEQ	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	LA-DEQ	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	LA-DEQ	4585	10184404
1,2-Dichlorobenzene	LA-DEQ	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	LA-DEQ	4635	10184404
1,2-Dichloropropane	LA-DEQ	4655	10184404
1,3,5-Trimethylbenzene	LA-DEQ	5215	10184404
1,3-Dichlorobenzene	LA-DEQ	4615	10184404
1,3-Dichloropropane	LA-DEQ	4660	10184404
1,4-Dichlorobenzene	LA-DEQ	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	LA-DEQ	4735	10184404
2,2-Dichloropropane	LA-DEQ	4665	10184404

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Matrix: ***Solid & Chemical Materials***

2-Butanone (Methyl ethyl ketone, MEK)	LA-DEQ	4410	10184404
2-Chloroethyl vinyl ether	LA-DEQ	4500	10184404
2-Chlorotoluene	LA-DEQ	4535	10184404
2-Hexanone (MBK)	LA-DEQ	4860	10184404
2-Nitropropane	LA-DEQ	5020	10184404
4-Chlorotoluene	LA-DEQ	4540	10184404
4-Isopropyltoluene (p-Cymene)	LA-DEQ	4915	10184404
4-Methyl-2-pentanone (MIBK)	LA-DEQ	4995	10184404
Acetone (2-Propanone)	LA-DEQ	4315	10184404
Acetonitrile	LA-DEQ	4320	10184404
Acrolein (Propenal)	LA-DEQ	4325	10184404
Acrylonitrile	LA-DEQ	4340	10184404
Allyl chloride (3-Chloropropene)	LA-DEQ	4355	10184404
Benzene	LA-DEQ	4375	10184404
Bromobenzene	LA-DEQ	4385	10184404
Bromochloromethane	LA-DEQ	4390	10184404
Bromodichloromethane	LA-DEQ	4395	10184404
Bromoform	LA-DEQ	4400	10184404
Carbon disulfide	LA-DEQ	4450	10184404
Carbon tetrachloride	LA-DEQ	4455	10184404
Chlorobenzene	LA-DEQ	4475	10184404
Chlorodibromomethane	LA-DEQ	4575	10184404
Chloroethane (Ethyl chloride)	LA-DEQ	4485	10184404
Chloroform	LA-DEQ	4505	10184404
Chloroprene (2-Chloro-1,3-butadiene)	LA-DEQ	4525	10184404
cis-1,2-Dichloroethylene	LA-DEQ	4645	10184404
cis-1,3-Dichloropropene	LA-DEQ	4680	10184404
cis-1,4-Dichloro-2-butene	LA-DEQ	4600	10184404
Dibromomethane (Methylene bromide)	LA-DEQ	4595	10184404
Dichlorodifluoromethane (Freon-12)	LA-DEQ	4625	10184404

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Matrix: ***Solid & Chemical Materials***

Diethyl ether	LA-DEQ	4725	10184404
Ethanol	LA-DEQ	4750	10184404
Ethyl acetate	LA-DEQ	4755	10184404
Ethyl methacrylate	LA-DEQ	4810	10184404
Ethylbenzene	LA-DEQ	4765	10184404
Hexachlorobutadiene	LA-DEQ	4835	10184404
Hexachloroethane	LA-DEQ	4840	10184404
Iodomethane (Methyl iodide)	LA-DEQ	4870	10184404
Isobutyl alcohol (2-Methyl-1-propanol)	LA-DEQ	4875	10184404
Isopropylbenzene (Cumene)	LA-DEQ	4900	10184404
m+p-xylene	LA-DEQ	5240	10184404
Methacrylonitrile	LA-DEQ	4925	10184404
Methyl acetate	LA-DEQ	4940	10184404
Methyl acrylate	LA-DEQ	4945	10184404
Methyl bromide (Bromomethane)	LA-DEQ	4950	10184404
Methyl chloride (Chloromethane)	LA-DEQ	4960	10184404
Methyl methacrylate	LA-DEQ	4990	10184404
Methyl tert-butyl ether (MTBE)	LA-DEQ	5000	10184404
Methylcyclohexane	LA-DEQ	4965	10184404
Methylene chloride (Dichloromethane)	LA-DEQ	4975	10184404
Naphthalene	LA-DEQ	5005	10184404
n-Butyl alcohol (1-Butanol, n-Butanol)	LA-DEQ	4425	10184404
n-Butylbenzene	LA-DEQ	4435	10184404
n-Propylbenzene	LA-DEQ	5090	10184404
o-Xylene	LA-DEQ	5250	10184404
Pentachloroethane	LA-DEQ	5035	10184404
Propionitrile (Ethyl cyanide)	LA-DEQ	5080	10184404
sec-Butylbenzene	LA-DEQ	4440	10184404
Styrene	LA-DEQ	5100	10184404
tert-Butyl alcohol	LA-DEQ	4420	10184404

Matrix: ***Solid & Chemical Materials***

tert-Butylbenzene	LA-DEQ	4445	10184404
Tetrachloroethylene (Perchloroethylene)	LA-DEQ	5115	10184404
Toluene	LA-DEQ	5140	10184404
trans-1,2-Dichloroethylene	LA-DEQ	4700	10184404
trans-1,3-Dichloropropylene	LA-DEQ	4685	10184404
trans-1,4-Dichloro-2-butene	LA-DEQ	4605	10184404
Trichloroethene (Trichloroethylene)	LA-DEQ	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	LA-DEQ	5175	10184404
Vinyl acetate	LA-DEQ	5225	10184404
Vinyl chloride	LA-DEQ	5235	10184404
Xylene (total)	LA-DEQ	5260	10184404

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	LA-DEQ	6715	10185203
1,2,4-Trichlorobenzene	LA-DEQ	5155	10185203
1,2-Dichlorobenzene	LA-DEQ	4610	10185203
1,2-Diphenylhydrazine	LA-DEQ	6220	10185203
1,3,5-Trinitrobenzene (1,3,5-TNB)	LA-DEQ	6885	10185203
1,3-Dichlorobenzene	LA-DEQ	4615	10185203
1,3-Dinitrobenzene (1,3-DNB)	LA-DEQ	6160	10185203
1,4-Dichlorobenzene	LA-DEQ	4620	10185203
1,4-Dinitrobenzene	LA-DEQ	6165	10185203
1,4-Naphthoquinone	LA-DEQ	6420	10185203
1,4-Phenylenediamine	LA-DEQ	6630	10185203
1-Chloronaphthalene	LA-DEQ	5790	10185203
1-Naphthylamine	LA-DEQ	6425	10185203
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	LA-DEQ	4659	10185203
2,3,4,6-Tetrachlorophenol	LA-DEQ	6735	10185203
2,4,5-Trichlorophenol	LA-DEQ	6835	10185203
2,4,6-Trichlorophenol	LA-DEQ	6840	10185203

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Matrix: ***Solid & Chemical Materials***

2,4-Dichlorophenol	LA-DEQ	6000	10185203
2,4-Dimethylphenol	LA-DEQ	6130	10185203
2,4-Dinitrophenol	LA-DEQ	6175	10185203
2,4-Dinitrotoluene (2,4-DNT)	LA-DEQ	6185	10185203
2,6-Dichlorophenol	LA-DEQ	6005	10185203
2,6-Dinitrotoluene (2,6-DNT)	LA-DEQ	6190	10185203
2-Acetylaminofluorene	LA-DEQ	5515	10185203
2-Chloronaphthalene	LA-DEQ	5795	10185203
2-Chlorophenol	LA-DEQ	5800	10185203
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	LA-DEQ	6360	10185203
2-Methylaniline (o-Toluidine)	LA-DEQ	5145	10185203
2-Methylnaphthalene	LA-DEQ	6385	10185203
2-Methylphenol (o-Cresol)	LA-DEQ	6400	10185203
2-Naphthylamine	LA-DEQ	6430	10185203
2-Nitroaniline	LA-DEQ	6460	10185203
2-Nitrophenol	LA-DEQ	6490	10185203
2-Picoline (2-Methylpyridine)	LA-DEQ	5050	10185203
3,3'-Dichlorobenzidine	LA-DEQ	5945	10185203
3,3'-Dimethylbenzidine	LA-DEQ	6120	10185203
3-Methylcholanthrene	LA-DEQ	6355	10185203
3-Methylphenol (m-Cresol)	LA-DEQ	6405	10185203
3-Nitroaniline	LA-DEQ	6465	10185203
4,4'-Methylenebis(2-chloroaniline)	LA-DEQ	6365	10185203
4-Aminobiphenyl	LA-DEQ	5540	10185203
4-Bromophenyl phenyl ether (BDE-3)	LA-DEQ	5660	10185203
4-Chloro-3-methylphenol	LA-DEQ	5700	10185203
4-Chloroaniline	LA-DEQ	5745	10185203
4-Chlorophenyl phenylether	LA-DEQ	5825	10185203
4-Dimethyl aminoazobenzene	LA-DEQ	6105	10185203
4-Methylphenol (p-Cresol)	LA-DEQ	6410	10185203

Matrix: ***Solid & Chemical Materials***

4-Nitroaniline	LA-DEQ	6470	10185203
4-Nitrophenol	LA-DEQ	6500	10185203
4-Nitroquinoline-1-oxide	LA-DEQ	6510	10185203
5-Nitro-o-toluidine	LA-DEQ	6570	10185203
7,12-Dimethylbenz(a) anthracene	LA-DEQ	6115	10185203
a-a-Dimethylphenethylamine	LA-DEQ	6125	10185203
Acenaphthene	LA-DEQ	5500	10185203
Acenaphthylene	LA-DEQ	5505	10185203
Acetophenone	LA-DEQ	5510	10185203
Aniline	LA-DEQ	5545	10185203
Anthracene	LA-DEQ	5555	10185203
Aramite	LA-DEQ	5560	10185203
Atrazine	LA-DEQ	7065	10185203
Benzenethiol (Thiophenol)	LA-DEQ	6750	10185203
Benzidine	LA-DEQ	5595	10185203
Benzo(a)anthracene	LA-DEQ	5575	10185203
Benzo(a)pyrene	LA-DEQ	5580	10185203
Benzo(b)fluoranthene	LA-DEQ	5585	10185203
Benzo(g,h,i)perylene	LA-DEQ	5590	10185203
Benzo(k)fluoranthene	LA-DEQ	5600	10185203
Benzoic acid	LA-DEQ	5610	10185203
Benzyl alcohol	LA-DEQ	5630	10185203
Biphenyl	LA-DEQ	5640	10185203
bis(2-Chloroethoxy)methane	LA-DEQ	5760	10185203
bis(2-Chloroethyl) ether	LA-DEQ	5765	10185203
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	LA-DEQ	6065	10185203
Butyl benzyl phthalate	LA-DEQ	5670	10185203
Caprolactam	LA-DEQ	7180	10185203
Carbazole	LA-DEQ	5680	10185203
Chlorobenzilate	LA-DEQ	7260	10185203

Matrix: ***Solid & Chemical Materials***

Chrysene	LA-DEQ	5855	10185203
Diallate	LA-DEQ	7405	10185203
Dibenz(a,h) anthracene	LA-DEQ	5895	10185203
Dibenz(a,j) acridine	LA-DEQ	5900	10185203
Dibenzo(a,e) pyrene	LA-DEQ	5890	10185203
Dibenzofuran	LA-DEQ	5905	10185203
Diethyl phthalate	LA-DEQ	6070	10185203
Dimethoate	LA-DEQ	7475	10185203
Dimethyl phthalate	LA-DEQ	6135	10185203
Di-n-butyl phthalate	LA-DEQ	5925	10185203
Di-n-octyl phthalate	LA-DEQ	6200	10185203
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	LA-DEQ	8620	10185203
Diphenylamine	LA-DEQ	6205	10185203
Disulfoton	LA-DEQ	8625	10185203
Ethyl methanesulfonate	LA-DEQ	6260	10185203
Famphur	LA-DEQ	7580	10185203
Fluoranthene	LA-DEQ	6265	10185203
Fluorene	LA-DEQ	6270	10185203
Hexachlorobenzene	LA-DEQ	6275	10185203
Hexachlorobutadiene	LA-DEQ	4835	10185203
Hexachlorocyclopentadiene	LA-DEQ	6285	10185203
Hexachloroethane	LA-DEQ	4840	10185203
Hexachlorophene	LA-DEQ	6290	10185203
Hexachloropropene	LA-DEQ	6295	10185203
Indeno(1,2,3-cd) pyrene	LA-DEQ	6315	10185203
Isodrin	LA-DEQ	7725	10185203
Isophorone	LA-DEQ	6320	10185203
Isosafrole	LA-DEQ	6325	10185203
Kepone	LA-DEQ	7740	10185203
Methapyrilene	LA-DEQ	6345	10185203

Matrix: ***Solid & Chemical Materials***

Methyl methanesulfonate	LA-DEQ	6375	10185203
Methyl parathion (Parathion, methyl)	LA-DEQ	7825	10185203
Methylphenols, total	LA-DEQ	10313	10185203
Naphthalene	LA-DEQ	5005	10185203
Nitrobenzene	LA-DEQ	5015	10185203
n-Nitrosodiethylamine	LA-DEQ	6525	10185203
n-Nitrosodimethylamine	LA-DEQ	6530	10185203
n-Nitrosodi-n-butylamine	LA-DEQ	5025	10185203
n-Nitrosodi-n-propylamine	LA-DEQ	6545	10185203
n-Nitrosodiphenylamine	LA-DEQ	6535	10185203
n-Nitrosomethylethylamine	LA-DEQ	6550	10185203
n-Nitrosomorpholine	LA-DEQ	6555	10185203
n-Nitrosopiperidine	LA-DEQ	6560	10185203
n-Nitrosopyrrolidine	LA-DEQ	6565	10185203
o,o,o-Triethyl phosphorothioate	LA-DEQ	8290	10185203
Parathion, ethyl	LA-DEQ	7955	10185203
Pentachlorobenzene	LA-DEQ	6590	10185203
Pentachloronitrobenzene (PCNB)	LA-DEQ	6600	10185203
Pentachlorophenol	LA-DEQ	6605	10185203
Phenacetin	LA-DEQ	6610	10185203
Phenanthrene	LA-DEQ	6615	10185203
Phenol	LA-DEQ	6625	10185203
Phorate	LA-DEQ	7985	10185203
Phthalic anhydride	LA-DEQ	6640	10185203
Pronamide (Kerb)	LA-DEQ	6650	10185203
Pyrene	LA-DEQ	6665	10185203
Pyridine	LA-DEQ	5095	10185203
Quinoline	LA-DEQ	6670	10185203
Safrole	LA-DEQ	6685	10185203
Sulfotepp	LA-DEQ	8155	10185203

Thionazin (Zinophos)	LA-DEQ	8235	10185203
tris-(2,3-Dibromopropyl) phosphate (tris-BP)	LA-DEQ	8310	10185203

Method EPA 8310

Analyte	**AB**	**Analyte ID**	**Method ID**
Acenaphthene	LA-DEQ	5500	10187607
Acenaphthylene	LA-DEQ	5505	10187607
Anthracene	LA-DEQ	5555	10187607
Benzo(a)anthracene	LA-DEQ	5575	10187607
Benzo(a)pyrene	LA-DEQ	5580	10187607
Benzo(b)fluoranthene	LA-DEQ	5585	10187607
Benzo(g,h,i)perylene	LA-DEQ	5590	10187607
Benzo(k)fluoranthene	LA-DEQ	5600	10187607
Chrysene	LA-DEQ	5855	10187607
Dibenz(a,h) anthracene	LA-DEQ	5895	10187607
Fluoranthene	LA-DEQ	6265	10187607
Fluorene	LA-DEQ	6270	10187607
Indeno(1,2,3-cd) pyrene	LA-DEQ	6315	10187607
Naphthalene	LA-DEQ	5005	10187607
Phenanthrene	LA-DEQ	6615	10187607
Pyrene	LA-DEQ	6665	10187607

Method EPA 8330

Analyte	**AB**	**Analyte ID**	**Method ID**
1,3,5-Trinitrobenzene (1,3,5-TNB)	LA-DEQ	6885	10189807
1,3-Dinitrobenzene (1,3-DNB)	LA-DEQ	6160	10189807
2,4,6-Trinitrotoluene (2,4,6-TNT)	LA-DEQ	9651	10189807
2,4-Dinitrotoluene (2,4-DNT)	LA-DEQ	6185	10189807
2,6-Dinitrotoluene (2,6-DNT)	LA-DEQ	6190	10189807
2-Amino-4,6-dinitrotoluene (2-am-dnt)	LA-DEQ	9303	10189807
2-Nitrotoluene	LA-DEQ	9507	10189807
3-Nitrotoluene	LA-DEQ	9510	10189807
4-Amino-2,6-dinitrotoluene (4-am-dnt)	LA-DEQ	9306	10189807

4-Nitrotoluene	LA-DEQ	9513	10189807
Methyl-2,4,6-trinitrophenylnitramine (tetryl)	LA-DEQ	6415	10189807
Nitrobenzene	LA-DEQ	5015	10189807
Nitroglycerin	LA-DEQ	6485	10189807
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	LA-DEQ	9522	10189807
Pentaerythritoltetranitrate (PETN)	LA-DEQ	9558	10189807
RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine)	LA-DEQ	9432	10189807

Method EPA 9012

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	LA-DEQ	1510	10193405
Total cyanide	LA-DEQ	1645	10193405

Method EPA 9023

Analyte	**AB**	**Analyte ID**	**Method ID**
Extractable organics halides (EOX)	LA-DEQ	1720	10195003

Method EPA 9034

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	LA-DEQ	2005	10196006

Method EPA 9045

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	LA-DEQ	1900	10197805

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	LA-DEQ	1610	10198808

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	LA-DEQ	1540	10199209
Chloride	LA-DEQ	1575	10199209
Fluoride	LA-DEQ	1730	10199209
Nitrate as N	LA-DEQ	1810	10199209
Nitrate-nitrite	LA-DEQ	1820	10199209
Nitrite as N	LA-DEQ	1840	10199209

Matrix: ***Solid & Chemical Materials***

Orthophosphate as P	LA-DEQ	1870	10199209
Sulfate	LA-DEQ	2000	10199209

Method EPA 906.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Tritium	LA-DEQ	3030	10310200

Method EPA 9066

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	LA-DEQ	1905	10200609

Method EPA 9071

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	LA-DEQ	1803	10201204
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	LA-DEQ	10220	10201204

Method EPA 9076

Analyte	**AB**	**Analyte ID**	**Method ID**
Total chlorine	LA-DEQ	1585	10202401

Method EPA 9095

Analyte	**AB**	**Analyte ID**	**Method ID**
Paint Filter Liquids Test	LA-DEQ	10312	10204009

Method EPA 9310

Analyte	**AB**	**Analyte ID**	**Method ID**
Gross-alpha	LA-DEQ	2830	10310802
Gross-beta	LA-DEQ	2840	10310802

Method HASL-300 Ga-01-R

Analyte	**AB**	**Analyte ID**	**Method ID**
Gross gamma	LA-DEQ	2855	90000207

Method HASL-300 U-02-RC

Analyte	**AB**	**Analyte ID**	**Method ID**
Uranium	LA-DEQ	3035	90011204

Method SM 2540 G

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	LA-DEQ	1950	20005203

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Environmental Science Corp. dba: Pace Analytical National Center for Testing & Innovation

12065 Lebanon Road
Mount Juliet, TN 37122-2508

Certificate: T104704245-19-16
Expiration Date: 10/31/2020
Issue Date: 11/1/2019

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Solid & Chemical Materials***

Method TCEQ 1005

Analyte	AB	Analyte ID	Method ID
Total Petroleum Hydrocarbons (TPH)	LA-DEQ	2050	90019208

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

Pace Analytical Services, LLC - Dallas, TX

400 West Bethany Drive, Suite 190
Allen, TX 75013-3714

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704232-19-29
Effective Date: 7/25/2019
Expiration Date: 6/30/2020

Executive Director Texas Commission on Environmental Quality

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate:	**T104704232-19-29**
Expiration Date:	**6/30/2020**
Issue Date:	**7/25/2019**

Pace Analytical Services, LLC - Dallas, TX

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Matrix: ***Drinking Water***

Method SM 9222 D (MFC Medium)

Analyte	AB	Analyte ID	Method ID
Fecal coliforms (enumeration)	TX	2530	20210008

Method SM 9223-IDEXX Laboratories Colilert® Test

Analyte	AB	Analyte ID	Method ID
Total coliforms and E. coli (P/A)	TX	2502	20212413

Method SM 9223-IDEXX Laboratories Colilert® Quanti-Tray Test

Analyte	AB	Analyte ID	Method ID
Escherichia coli (enumeration)	TX	2525	20211603
Total coliforms (enumeration)	TX	2500	20211603

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

Method EPA 1010

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	TX	1780	10116606

Method EPA 120.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10006403

Method EPA 1311

Analyte	**AB**	**Analyte ID**	**Method ID**
TCLP	TX	849	10118806

Method EPA 1312

Analyte	**AB**	**Analyte ID**	**Method ID**
SPLP	TX	850	10119003

Method EPA 160.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-volatile	TX	1970	10010409

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	TX	10220	10127807

Method EPA 1666

Analyte	**AB**	**Analyte ID**	**Method ID**
Ethyl acetate	TX	4755	10128208
Isopropyl acetate	TX	4890	10128208
n-Amyl acetate	TX	4360	10128208

Method EPA 180.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	TX	2055	10011606

Method EPA 200.7

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10013806
Antimony	TX	1005	10013806

Matrix: ***Non-Potable Water***

Arsenic	TX	1010	10013806
Barium	TX	1015	10013806
Beryllium	TX	1020	10013806
Boron	TX	1025	10013806
Cadmium	TX	1030	10013806
Calcium	TX	1035	10013806
Chromium	TX	1040	10013806
Cobalt	TX	1050	10013806
Copper	TX	1055	10013806
Iron	TX	1070	10013806
Lead	TX	1075	10013806
Magnesium	TX	1085	10013806
Manganese	TX	1090	10013806
Molybdenum	TX	1100	10013806
Nickel	TX	1105	10013806
Potassium	TX	1125	10013806
Selenium	TX	1140	10013806
Silver	TX	1150	10013806
Sodium	TX	1155	10013806
Strontium	TX	1160	10013806
Thallium	TX	1165	10013806
Tin	TX	1175	10013806
Titanium	TX	1180	10013806
Vanadium	TX	1185	10013806
Zinc	TX	1190	10013806

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605

Matrix: ***Non-Potable Water***

Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Cadmium	TX	1030	10014605
Calcium	TX	1035	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605
Copper	TX	1055	10014605
Iron	TX	1070	10014605
Lead	TX	1075	10014605
Magnesium	TX	1085	10014605
Manganese	TX	1090	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Potassium	TX	1125	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Thallium	TX	1165	10014605
Vanadium	TX	1185	10014605
Zinc	TX	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200

Certificate:	**T104704232-19-29**
Expiration Date:	**6/30/2020**
Issue Date:	**7/25/2019**

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Matrix: ***Non-Potable Water***

Sulfate	TX	2000	10053200

Method EPA 353.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrate as N	TX	1810	10067400
Nitrate-nitrite	TX	1820	10067400
Nitrite as N	TX	1840	10067400

Method EPA 420.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10079400

Method EPA 524.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Acetone (2-Propanone)	TX	4315	10088809
Methylene chloride (Dichloromethane)	TX	4975	10088809

Method EPA 6010

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10155609
Antimony	TX	1005	10155609
Arsenic	TX	1010	10155609
Barium	TX	1015	10155609
Beryllium	TX	1020	10155609
Boron	TX	1025	10155609
Cadmium	TX	1030	10155609
Calcium	TX	1035	10155609
Chromium	TX	1040	10155609
Cobalt	TX	1050	10155609
Copper	TX	1055	10155609
Iron	TX	1070	10155609
Lead	TX	1075	10155609
Magnesium	TX	1085	10155609
Manganese	TX	1090	10155609
Molybdenum	TX	1100	10155609

Matrix: ***Non-Potable Water***

Nickel	TX	1105	10155609
Potassium	TX	1125	10155609
Selenium	TX	1140	10155609
Silver	TX	1150	10155609
Sodium	TX	1155	10155609
Strontium	TX	1160	10155609
Thallium	TX	1165	10155609
Tin	TX	1175	10155609
Titanium	TX	1180	10155609
Vanadium	TX	1185	10155609
Zinc	TX	1190	10155609

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419

Certificate:	**T104704232-19-29**
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Matrix: ***Non-Potable Water***

Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419
Thallium	TX	1165	10156419
Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 608

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603
Aroclor-1248 (PCB-1248)	TX	8900	10103603
Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603

Matrix: ***Non-Potable Water***

Heptachlor	TX	7685	10103603
Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603
Toxaphene (Chlorinated camphene)	TX	8250	10103603

Method EPA 608.3

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10296625
4,4'-DDE	TX	7360	10296625
4,4'-DDT	TX	7365	10296625
Aldrin	TX	7025	10296625
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10296625
alpha-Chlordane	TX	7240	10296625
Aroclor-1016 (PCB-1016)	TX	8880	10296625
Aroclor-1221 (PCB-1221)	TX	8885	10296625
Aroclor-1232 (PCB-1232)	TX	8890	10296625
Aroclor-1242 (PCB-1242)	TX	8895	10296625
Aroclor-1248 (PCB-1248)	TX	8900	10296625
Aroclor-1254 (PCB-1254)	TX	8905	10296625
Aroclor-1260 (PCB-1260)	TX	8910	10296625
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10296625
Chlordane (tech.)	TX	7250	10296625
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10296625
Dieldrin	TX	7470	10296625
Endosulfan I	TX	7510	10296625
Endosulfan II	TX	7515	10296625
Endosulfan sulfate	TX	7520	10296625
Endrin	TX	7540	10296625
Endrin aldehyde	TX	7530	10296625
Endrin ketone	TX	7535	10296625
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10296625

Matrix: ***Non-Potable Water***

gamma-Chlordane	TX	7245	10296625
Heptachlor	TX	7685	10296625
Heptachlor epoxide	TX	7690	10296625
Methoxychlor	TX	7810	10296625
Toxaphene (Chlorinated camphene)	TX	8250	10296625

Method EPA 615

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	TX	8655	10298201
2,4-D	TX	8545	10298201
2,4-DB	TX	8560	10298201
Dalapon	TX	8555	10298201
Dicamba	TX	8595	10298201
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10298201
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10298201
MCPA	TX	7775	10298201
MCPP	TX	7780	10298201
Silvex (2,4,5-TP)	TX	8650	10298201

Method EPA 624

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207
1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

	Certificate:	**T104704232-19-29**
Pace Analytical Services, LLC - Dallas, TX	**Expiration Date:**	**6/30/2020**
	Issue Date:	**7/25/2019**

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Matrix: ***Non-Potable Water***

2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207
Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,2-Dichloroethylene	TX	4645	10107207
cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
Naphthalene	TX	5005	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
Total trihalomethanes	TX	5205	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207
Vinyl chloride	TX	5235	10107207

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Matrix: ***Non-Potable Water***

Xylene (total)	TX	5260	10107207

Method EPA 624.1

Analyte	AB	Analyte ID	Method ID
1,1,1-Trichloroethane	TX	5160	10298121
1,1,2,2-Tetrachloroethane	TX	5110	10298121
1,1,2-Trichloroethane	TX	5165	10298121
1,1-Dichloroethane	TX	4630	10298121
1,1-Dichloroethylene	TX	4640	10298121
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10298121
1,2-Dichlorobenzene	TX	4610	10298121
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10298121
1,2-Dichloropropane	TX	4655	10298121
1,3-Dichlorobenzene	TX	4615	10298121
1,4-Dichlorobenzene	TX	4620	10298121
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10298121
2-Chloroethyl vinyl ether	TX	4500	10298121
Acetone (2-Propanone)	TX	4315	10298121
Acrolein (Propenal)	TX	4325	10298121
Acrylonitrile	TX	4340	10298121
Benzene	TX	4375	10298121
Bromodichloromethane	TX	4395	10298121
Bromoform	TX	4400	10298121
Carbon tetrachloride	TX	4455	10298121
Chlorobenzene	TX	4475	10298121
Chlorodibromomethane	TX	4575	10298121
Chloroethane (Ethyl chloride)	TX	4485	10298121
Chloroform	TX	4505	10298121
cis-1,2-Dichloroethylene	TX	4645	10298121
cis-1,3-Dichloropropene	TX	4680	10298121
Ethylbenzene	TX	4765	10298121

Matrix: ***Non-Potable Water***

m+p-xylene	TX	5240	10298121
Methyl bromide (Bromomethane)	TX	4950	10298121
Methyl chloride (Chloromethane)	TX	4960	10298121
Methyl tert-butyl ether (MTBE)	TX	5000	10298121
Methylene chloride (Dichloromethane)	TX	4975	10298121
Naphthalene	TX	5005	10298121
o-Xylene	TX	5250	10298121
Tetrachloroethylene (Perchloroethylene)	TX	5115	10298121
Toluene	TX	5140	10298121
Total trihalomethanes	TX	5205	10298121
trans-1,2-Dichloroethylene	TX	4700	10298121
trans-1,3-Dichloropropylene	TX	4685	10298121
Trichloroethene (Trichloroethylene)	TX	5170	10298121
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10298121
Vinyl chloride	TX	5235	10298121
Xylene (total)	TX	5260	10298121

Method EPA 625

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401
1,2,4-Trichlorobenzene	TX	5155	10107401
1,2-Dichlorobenzene	TX	4610	10107401
1,2-Diphenylhydrazine	TX	6220	10107401
1,3-Dichlorobenzene	TX	4615	10107401
1,4-Dichlorobenzene	TX	4620	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,3,4,6-Tetrachlorophenol	TX	6735	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Pace Analytical Services, LLC - Dallas, TX

400 West Bethany Drive, Suite 190
Allen, TX 75013-3714

Certificate: T104704232-19-29
Expiration Date: 6/30/2020
Issue Date: 7/25/2019

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Matrix: ***Non-Potable Water***

2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401
Acenaphthylene	TX	5505	10107401
Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401
Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401
Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401

Texas Commission on Environmental Quality

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Allen, TX 75013-3714

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Matrix: ***Non-Potable Water***

Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401
n-Nitrosodi-n-butylamine	TX	5025	10107401
n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401
Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401
Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401

Method EPA 625.1

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10300024
1,2,4-Trichlorobenzene	TX	5155	10300024
1,2-Dichlorobenzene	TX	4610	10300024
1,2-Diphenylhydrazine	TX	6221	10300024

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

1,3-Dichlorobenzene	TX	4615	10300024
1,4-Dichlorobenzene	TX	4620	10300024
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10300024
2,3,4,6-Tetrachlorophenol	TX	6735	10300024
2,4,5-Trichlorophenol	TX	6835	10300024
2,4,6-Trichlorophenol	TX	6840	10300024
2,4-Dichlorophenol	TX	6000	10300024
2,4-Dimethylphenol	TX	6130	10300024
2,4-Dinitrophenol	TX	6175	10300024
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10300024
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10300024
2-Chloronaphthalene	TX	5795	10300024
2-Chlorophenol	TX	5800	10300024
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10300024
2-Methylphenol (o-Cresol)	TX	6400	10300024
2-Nitrophenol	TX	6490	10300024
3,3'-Dichlorobenzidine	TX	5945	10300024
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10300024
4-Chloro-3-methylphenol	TX	5700	10300024
4-Chlorophenyl phenylether	TX	5825	10300024
4-Methylphenol (p-Cresol)	TX	6410	10300024
4-Nitrophenol	TX	6500	10300024
Acenaphthene	TX	5500	10300024
Acenaphthylene	TX	5505	10300024
Anthracene	TX	5555	10300024
Benzidine	TX	5595	10300024
Benzo(a)anthracene	TX	5575	10300024
Benzo(a)pyrene	TX	5580	10300024
Benzo(b)fluoranthene	TX	5585	10300024
Benzo(g,h,i)perylene	TX	5590	10300024

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Matrix: ***Non-Potable Water***

Benzo(k)fluoranthene	TX	5600	10300024
bis(2-Chloroethoxy)methane	TX	5760	10300024
bis(2-Chloroethyl) ether	TX	5765	10300024
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10300024
Butyl benzyl phthalate	TX	5670	10300024
Chrysene	TX	5855	10300024
Dibenz(a,h) anthracene	TX	5895	10300024
Diethyl phthalate	TX	6070	10300024
Dimethyl phthalate	TX	6135	10300024
Di-n-butyl phthalate	TX	5925	10300024
Di-n-octyl phthalate	TX	6200	10300024
Fluoranthene	TX	6265	10300024
Fluorene	TX	6270	10300024
Hexachlorobenzene	TX	6275	10300024
Hexachlorobutadiene	TX	4835	10300024
Hexachlorocyclopentadiene	TX	6285	10300024
Hexachloroethane	TX	4840	10300024
Indeno(1,2,3-cd) pyrene	TX	6315	10300024
Isophorone	TX	6320	10300024
Naphthalene	TX	5005	10300024
Nitrobenzene	TX	5015	10300024
n-Nitrosodiethylamine	TX	6525	10300024
n-Nitrosodimethylamine	TX	6530	10300024
n-Nitrosodi-n-butylamine	TX	5025	10300024
n-Nitrosodi-n-propylamine	TX	6545	10300024
n-Nitrosodiphenylamine	TX	6535	10300024
Pentachlorobenzene	TX	6590	10300024
Pentachlorophenol	TX	6605	10300024
Phenanthrene	TX	6615	10300024
Phenol	TX	6625	10300024

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Matrix: ***Non-Potable Water***

Pyrene	TX	6665	10300024
Pyridine	TX	5095	10300024

Method EPA 632

Analyte	**AB**	**Analyte ID**	**Method ID**
Carbaryl (Sevin)	TX	7195	10108608

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165807

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178606
4,4'-DDE	TX	7360	10178606
4,4'-DDT	TX	7365	10178606
Aldrin	TX	7025	10178606
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178606
alpha-Chlordane	TX	7240	10178606
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178606
Chlordane (tech.)	TX	7250	10178606
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178606
Dieldrin	TX	7470	10178606
Endosulfan I	TX	7510	10178606
Endosulfan II	TX	7515	10178606
Endosulfan sulfate	TX	7520	10178606
Endrin	TX	7540	10178606
Endrin aldehyde	TX	7530	10178606
Endrin ketone	TX	7535	10178606
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178606
gamma-Chlordane	TX	7245	10178606

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Matrix: ***Non-Potable Water***

Heptachlor	TX	7685	10178606
Heptachlor epoxide	TX	7690	10178606
Methoxychlor	TX	7810	10178606
Mirex	TX	7870	10178606
Toxaphene (Chlorinated camphene)	TX	8250	10178606

Method EPA 8082

Analyte	AB	Analyte ID	Method ID
Aroclor-1016 (PCB-1016)	TX	8880	10179007
Aroclor-1221 (PCB-1221)	TX	8885	10179007
Aroclor-1232 (PCB-1232)	TX	8890	10179007
Aroclor-1242 (PCB-1242)	TX	8895	10179007
Aroclor-1248 (PCB-1248)	TX	8900	10179007
Aroclor-1254 (PCB-1254)	TX	8905	10179007
Aroclor-1260 (PCB-1260)	TX	8910	10179007
PCBs (total)	TX	8870	10179007

Method EPA 8151

Analyte	AB	Analyte ID	Method ID
2,4,5-T	TX	8655	10183207
2,4-D	TX	8545	10183207
2,4-DB	TX	8560	10183207
Dalapon	TX	8555	10183207
Dicamba	TX	8595	10183207
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183207
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183207
MCPA	TX	7775	10183207
MCPP	TX	7780	10183207
Pentachlorophenol	TX	6605	10183207
Silvex (2,4,5-TP)	TX	8650	10183207

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184802

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

1,1,1-Trichloroethane	TX	5160	10184802
1,1,2,2-Tetrachloroethane	TX	5110	10184802
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184802
1,1,2-Trichloroethane	TX	5165	10184802
1,1-Dichloroethane	TX	4630	10184802
1,1-Dichloroethylene	TX	4640	10184802
1,1-Dichloropropene	TX	4670	10184802
1,2,3-Trichlorobenzene	TX	5150	10184802
1,2,3-Trichloropropane	TX	5180	10184802
1,2,4-Trichlorobenzene	TX	5155	10184802
1,2,4-Trimethylbenzene	TX	5210	10184802
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184802
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184802
1,2-Dichlorobenzene	TX	4610	10184802
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184802
1,2-Dichloropropane	TX	4655	10184802
1,3,5-Trimethylbenzene	TX	5215	10184802
1,3-Dichlorobenzene	TX	4615	10184802
1,3-Dichloropropane	TX	4660	10184802
1,4-Dichlorobenzene	TX	4620	10184802
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184802
2,2-Dichloropropane	TX	4665	10184802
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184802
2-Chloroethyl vinyl ether	TX	4500	10184802
2-Chlorotoluene	TX	4535	10184802
2-Hexanone (MBK)	TX	4860	10184802
4-Chlorotoluene	TX	4540	10184802
4-Isopropyltoluene (p-Cymene)	TX	4915	10184802
4-Methyl-2-pentanone (MIBK)	TX	4995	10184802
Acetone (2-Propanone)	TX	4315	10184802

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Matrix: ***Non-Potable Water***

Acetonitrile	TX	4320	10184802
Acrolein (Propenal)	TX	4325	10184802
Acrylonitrile	TX	4340	10184802
Allyl chloride (3-Chloropropene)	TX	4355	10184802
Benzene	TX	4375	10184802
Benzyl chloride	TX	5635	10184802
Bromobenzene	TX	4385	10184802
Bromochloromethane	TX	4390	10184802
Bromodichloromethane	TX	4395	10184802
Bromoform	TX	4400	10184802
Carbon disulfide	TX	4450	10184802
Carbon tetrachloride	TX	4455	10184802
Chlorobenzene	TX	4475	10184802
Chlorodibromomethane	TX	4575	10184802
Chloroethane (Ethyl chloride)	TX	4485	10184802
Chloroform	TX	4505	10184802
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184802
cis-1,2-Dichloroethylene	TX	4645	10184802
cis-1,3-Dichloropropene	TX	4680	10184802
Dibromomethane (Methylene bromide)	TX	4595	10184802
Dichlorodifluoromethane (Freon-12)	TX	4625	10184802
Ethyl acetate	TX	4755	10184802
Ethyl methacrylate	TX	4810	10184802
Ethylbenzene	TX	4765	10184802
Hexachlorobutadiene	TX	4835	10184802
Hexachloroethane	TX	4840	10184802
Iodomethane (Methyl iodide)	TX	4870	10184802
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184802
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184802
Isopropylbenzene (Cumene)	TX	4900	10184802

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Matrix: ***Non-Potable Water***

m+p-xylene	TX	5240	10184802
Methacrylonitrile	TX	4925	10184802
Methyl acetate	TX	4940	10184802
Methyl bromide (Bromomethane)	TX	4950	10184802
Methyl chloride (Chloromethane)	TX	4960	10184802
Methyl methacrylate	TX	4990	10184802
Methyl tert-butyl ether (MTBE)	TX	5000	10184802
Methylene chloride (Dichloromethane)	TX	4975	10184802
Naphthalene	TX	5005	10184802
n-Butylbenzene	TX	4435	10184802
n-Propylbenzene	TX	5090	10184802
o-Xylene	TX	5250	10184802
Pentachloroethane	TX	5035	10184802
Propionitrile (Ethyl cyanide)	TX	5080	10184802
sec-Butylbenzene	TX	4440	10184802
Styrene	TX	5100	10184802
tert-Butylbenzene	TX	4445	10184802
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184802
Toluene	TX	5140	10184802
trans-1,2-Dichloroethylene	TX	4700	10184802
trans-1,3-Dichloropropylene	TX	4685	10184802
trans-1,4-Dichloro-2-butene	TX	4605	10184802
Trichloroethene (Trichloroethylene)	TX	5170	10184802
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184802
Vinyl acetate	TX	5225	10184802
Vinyl chloride	TX	5235	10184802
Xylene (total)	TX	5260	10184802

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10185805

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Matrix: ***Non-Potable Water***

1,2,4-Trichlorobenzene	TX	5155	10185805
1,2-Dichlorobenzene	TX	4610	10185805
1,2-Dinitrobenzene	TX	6155	10185805
1,3-Dichlorobenzene	TX	4615	10185805
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185805
1,4-Dichlorobenzene	TX	4620	10185805
1,4-Dinitrobenzene	TX	6165	10185805
1,4-Naphthoquinone	TX	6420	10185805
1-Chloronaphthalene	TX	5790	10185805
1-Naphthylamine	TX	6425	10185805
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185805
2,3,4,6-Tetrachlorophenol	TX	6735	10185805
2,4,5-Trichlorophenol	TX	6835	10185805
2,4,6-Trichlorophenol	TX	6840	10185805
2,4-Dichlorophenol	TX	6000	10185805
2,4-Dimethylphenol	TX	6130	10185805
2,4-Dinitrophenol	TX	6175	10185805
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185805
2,6-Dichlorophenol	TX	6005	10185805
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185805
2-Acetylaminofluorene	TX	5515	10185805
2-Chloronaphthalene	TX	5795	10185805
2-Chlorophenol	TX	5800	10185805
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185805
2-Methylaniline (o-Toluidine)	TX	5145	10185805
2-Methylnaphthalene	TX	6385	10185805
2-Methylphenol (o-Cresol)	TX	6400	10185805
2-Naphthylamine	TX	6430	10185805
2-Nitroaniline	TX	6460	10185805
2-Nitrophenol	TX	6490	10185805

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Matrix: ***Non-Potable Water***

2-Picoline (2-Methylpyridine)	TX	5050	10185805
3,3'-Dichlorobenzidine	TX	5945	10185805
3-Methylcholanthrene	TX	6355	10185805
3-Methylphenol (m-Cresol)	TX	6405	10185805
3-Nitroaniline	TX	6465	10185805
4-Aminobiphenyl	TX	5540	10185805
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185805
4-Chloro-3-methylphenol	TX	5700	10185805
4-Chloroaniline	TX	5745	10185805
4-Chlorophenyl phenylether	TX	5825	10185805
4-Dimethyl aminoazobenzene	TX	6105	10185805
4-Methylphenol (p-Cresol)	TX	6410	10185805
4-Nitroaniline	TX	6470	10185805
4-Nitrobiphenyl	TX	6480	10185805
4-Nitrophenol	TX	6500	10185805
5,5-Diphenylhydantoin	TX	6215	10185805
5-Chloro-2-methylaniline	TX	5695	10185805
5-Nitroacenaphthene	TX	6455	10185805
5-Nitro-o-toluidine	TX	6570	10185805
7,12-Dimethylbenz(a) anthracene	TX	6115	10185805
Acenaphthene	TX	5500	10185805
Acenaphthylene	TX	5505	10185805
Acetophenone	TX	5510	10185805
Aminoazobenzene	TX	5535	10185805
Aniline	TX	5545	10185805
Anthracene	TX	5555	10185805
Azobenzene	TX	5562	10185805
Benzidine	TX	5595	10185805
Benzo(a)anthracene	TX	5575	10185805
Benzo(a)pyrene	TX	5580	10185805

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704232-19-29

Pace Analytical Services, LLC - Dallas, TX

Expiration Date: 6/30/2020

400 West Bethany Drive, Suite 190
Allen, TX 75013-3714

Issue Date: 7/25/2019

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Matrix: ***Non-Potable Water***

Benzo(b)fluoranthene	TX	5585	10185805
Benzo(g,h,i)perylene	TX	5590	10185805
Benzo(k)fluoranthene	TX	5600	10185805
Benzoic acid	TX	5610	10185805
Benzyl alcohol	TX	5630	10185805
bis(2-Chloroethoxy)methane	TX	5760	10185805
bis(2-Chloroethyl) ether	TX	5765	10185805
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185805
Butyl benzyl phthalate	TX	5670	10185805
Carbazole	TX	5680	10185805
Chrysene	TX	5855	10185805
Dibenz(a,h) anthracene	TX	5895	10185805
Dibenzofuran	TX	5905	10185805
Diethyl phthalate	TX	6070	10185805
Diethylstilbestrol	TX	6075	10185805
Dimethyl phthalate	TX	6135	10185805
Di-n-butyl phthalate	TX	5925	10185805
Di-n-octyl phthalate	TX	6200	10185805
Diphenylamine	TX	6205	10185805
Ethyl methanesulfonate	TX	6260	10185805
Fluoranthene	TX	6265	10185805
Fluorene	TX	6270	10185805
Hexachlorobenzene	TX	6275	10185805
Hexachlorobutadiene	TX	4835	10185805
Hexachlorocyclopentadiene	TX	6285	10185805
Hexachloroethane	TX	4840	10185805
Hexachloropropene	TX	6295	10185805
Indeno(1,2,3-cd) pyrene	TX	6315	10185805
Isodrin	TX	7725	10185805
Isophorone	TX	6320	10185805

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Matrix: ***Non-Potable Water***

Isosafrole	TX	6325	10185805
Mestranol	TX	6340	10185805
Methyl methanesulfonate	TX	6375	10185805
Naphthalene	TX	5005	10185805
Nitrobenzene	TX	5015	10185805
n-Nitrosodiethylamine	TX	6525	10185805
n-Nitrosodimethylamine	TX	6530	10185805
n-Nitrosodi-n-butylamine	TX	5025	10185805
n-Nitrosodi-n-propylamine	TX	6545	10185805
n-Nitrosodiphenylamine	TX	6535	10185805
n-Nitrosomethylethylamine	TX	6550	10185805
n-Nitrosomorpholine	TX	6555	10185805
n-Nitrosopiperidine	TX	6560	10185805
n-Nitrosopyrrolidine	TX	6565	10185805
o-Anisidine	TX	5550	10185805
p-Cresidine	TX	5860	10185805
Pentachlorobenzene	TX	6590	10185805
Pentachloronitrobenzene (PCNB)	TX	6600	10185805
Pentachlorophenol	TX	6605	10185805
Phenacetin	TX	6610	10185805
Phenanthrene	TX	6615	10185805
Phenol	TX	6625	10185805
Pronamide (Kerb)	TX	6650	10185805
Pyrene	TX	6665	10185805
Pyridine	TX	5095	10185805
Safrole	TX	6685	10185805

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	10196802

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198808

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10200201

Method EPA 9065

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10200405

Method IDEXX Laboratories Colilert®

Analyte	**AB**	**Analyte ID**	**Method ID**
Escherichia coli (enumeration)	TX	2525	60002600

Method SM 2120 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Color	TX	1605	20223807

Method SM 2320 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	20045005

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Matrix: ***Non-Potable Water***

Method SM 2340 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total hardness as CaCO3	TX	1755	20046008

Method SM 2540 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	TX	1950	20004608

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 2540 F

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-settleable	TX	1965	20005009

Method SM 3500-Cr B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	20065809

Method SM 3500-Fe D

Analyte	**AB**	**Analyte ID**	**Method ID**
Iron	TX	1070	20009603

Method SM 4500-CN$^-$ E

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	20021209

Method SM 4500-CN$^-$ G

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	20021607

Method SM 4500-H+ B

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	20104603

Method SM 4500-NH3 H

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

Ammonia as N	TX	1515	20023409

Method SM 4500-O C

Analyte	**AB**	**Analyte ID**	**Method ID**
Oxygen, dissolved	TX	1880	20025201

Method SM 4500-P E

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	TX	1870	20025803
Phosphorus	TX	1910	20025803

Method SM 4500-S2^{-} D

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	TX	2005	20125400

Method SM 4500-S2^{-} F

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	TX	2005	20126209

Method SM 5210 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5220 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	20027809

Method SM 5310 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	20138209

Method SM 5540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Surfactants - MBAS	TX	2025	20144405

Method SM 9222 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total coliforms (enumeration)	TX	2500	20198009

Method SM 9222 D

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

Fecal coliforms (enumeration)	TX	2530	20037405

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

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Matrix: ***Solid & Chemical Materials***

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 1030

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10117201

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Sulfate	TX	2000	10053200

Method EPA 353.2

Analyte	AB	Analyte ID	Method ID
Nitrate as N	TX	1810	10067604
Nitrate-nitrite	TX	1820	10067604
Nitrite as N	TX	1840	10067604

Method EPA 6010

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10155609
Antimony	TX	1005	10155609
Arsenic	TX	1010	10155609

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Matrix: ***Solid & Chemical Materials***

Barium	TX	1015	10155609
Beryllium	TX	1020	10155609
Boron	TX	1025	10155609
Cadmium	TX	1030	10155609
Calcium	TX	1035	10155609
Chromium	TX	1040	10155609
Cobalt	TX	1050	10155609
Copper	TX	1055	10155609
Iron	TX	1070	10155609
Lead	TX	1075	10155609
Magnesium	TX	1085	10155609
Manganese	TX	1090	10155609
Molybdenum	TX	1100	10155609
Nickel	TX	1105	10155609
Potassium	TX	1125	10155609
Selenium	TX	1140	10155609
Silver	TX	1150	10155609
Strontium	TX	1160	10155609
Thallium	TX	1165	10155609
Tin	TX	1175	10155609
Titanium	TX	1180	10155609
Vanadium	TX	1185	10155609
Zinc	TX	1190	10155609

Method EPA 6020

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419

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Matrix: ***Solid & Chemical Materials***

Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Thallium	TX	1165	10156419
Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10166208

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178606
4,4'-DDE	TX	7360	10178606
4,4'-DDT	TX	7365	10178606
Aldrin	TX	7025	10178606
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178606
alpha-Chlordane	TX	7240	10178606
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178606
Chlordane (tech.)	TX	7250	10178606
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178606

Matrix: ***Solid & Chemical Materials***

Dieldrin	TX	7470	10178606
Endosulfan I	TX	7510	10178606
Endosulfan II	TX	7515	10178606
Endosulfan sulfate	TX	7520	10178606
Endrin	TX	7540	10178606
Endrin aldehyde	TX	7530	10178606
Endrin ketone	TX	7535	10178606
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178606
gamma-Chlordane	TX	7245	10178606
Heptachlor	TX	7685	10178606
Heptachlor epoxide	TX	7690	10178606
Methoxychlor	TX	7810	10178606
Mirex	TX	7870	10178606
Toxaphene (Chlorinated camphene)	TX	8250	10178606

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179007
Aroclor-1221 (PCB-1221)	TX	8885	10179007
Aroclor-1232 (PCB-1232)	TX	8890	10179007
Aroclor-1242 (PCB-1242)	TX	8895	10179007
Aroclor-1248 (PCB-1248)	TX	8900	10179007
Aroclor-1254 (PCB-1254)	TX	8905	10179007
Aroclor-1260 (PCB-1260)	TX	8910	10179007
PCBs (total)	TX	8870	10179007

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	TX	5105	10184802
1,1,1-Trichloroethane	TX	5160	10184802
1,1,2,2-Tetrachloroethane	TX	5110	10184802
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184802
1,1,2-Trichloroethane	TX	5165	10184802

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Matrix: ***Solid & Chemical Materials***

1,1-Dichloroethane	TX	4630	10184802
1,1-Dichloroethylene	TX	4640	10184802
1,1-Dichloropropene	TX	4670	10184802
1,2,3-Trichlorobenzene	TX	5150	10184802
1,2,3-Trichloropropane	TX	5180	10184802
1,2,4-Trichlorobenzene	TX	5155	10184802
1,2,4-Trimethylbenzene	TX	5210	10184802
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184802
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184802
1,2-Dichlorobenzene	TX	4610	10184802
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184802
1,2-Dichloropropane	TX	4655	10184802
1,3,5-Trimethylbenzene	TX	5215	10184802
1,3-Dichlorobenzene	TX	4615	10184802
1,3-Dichloropropane	TX	4660	10184802
1,4-Dichlorobenzene	TX	4620	10184802
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184802
2,2-Dichloropropane	TX	4665	10184802
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184802
2-Chloroethyl vinyl ether	TX	4500	10184802
2-Chlorotoluene	TX	4535	10184802
2-Hexanone (MBK)	TX	4860	10184802
4-Chlorotoluene	TX	4540	10184802
4-Isopropyltoluene (p-Cymene)	TX	4915	10184802
4-Methyl-2-pentanone (MIBK)	TX	4995	10184802
Acetone (2-Propanone)	TX	4315	10184802
Acetonitrile	TX	4320	10184802
Acrolein (Propenal)	TX	4325	10184802
Acrylonitrile	TX	4340	10184802
Allyl chloride (3-Chloropropene)	TX	4355	10184802

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Matrix: ***Solid & Chemical Materials***

Benzene	TX	4375	10184802
Benzyl chloride	TX	5635	10184802
Bromobenzene	TX	4385	10184802
Bromochloromethane	TX	4390	10184802
Bromodichloromethane	TX	4395	10184802
Bromoform	TX	4400	10184802
Carbon disulfide	TX	4450	10184802
Carbon tetrachloride	TX	4455	10184802
Chlorobenzene	TX	4475	10184802
Chlorodibromomethane	TX	4575	10184802
Chloroethane (Ethyl chloride)	TX	4485	10184802
Chloroform	TX	4505	10184802
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184802
cis-1,2-Dichloroethylene	TX	4645	10184802
cis-1,3-Dichloropropene	TX	4680	10184802
Dibromomethane (Methylene bromide)	TX	4595	10184802
Dichlorodifluoromethane (Freon-12)	TX	4625	10184802
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184802
Ethyl acetate	TX	4755	10184802
Ethyl methacrylate	TX	4810	10184802
Ethylbenzene	TX	4765	10184802
Hexachlorobutadiene	TX	4835	10184802
Hexachloroethane	TX	4840	10184802
Iodomethane (Methyl iodide)	TX	4870	10184802
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184802
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184802
Isopropylbenzene (Cumene)	TX	4900	10184802
m+p-xylene	TX	5240	10184802
Methacrylonitrile	TX	4925	10184802
Methyl acetate	TX	4940	10184802

Matrix: ***Solid & Chemical Materials***

Methyl bromide (Bromomethane)	TX	4950	10184802
Methyl chloride (Chloromethane)	TX	4960	10184802
Methyl methacrylate	TX	4990	10184802
Methyl tert-butyl ether (MTBE)	TX	5000	10184802
Methylene chloride (Dichloromethane)	TX	4975	10184802
Naphthalene	TX	5005	10184802
n-Butylbenzene	TX	4435	10184802
n-Propylbenzene	TX	5090	10184802
o-Xylene	TX	5250	10184802
Pentachloroethane	TX	5035	10184802
Propionitrile (Ethyl cyanide)	TX	5080	10184802
sec-Butylbenzene	TX	4440	10184802
Styrene	TX	5100	10184802
tert-Butylbenzene	TX	4445	10184802
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184802
Toluene	TX	5140	10184802
trans-1,2-Dichloroethylene	TX	4700	10184802
trans-1,3-Dichloropropylene	TX	4685	10184802
trans-1,4-Dichloro-2-butene	TX	4605	10184802
Trichloroethene (Trichloroethylene)	TX	5170	10184802
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184802
Vinyl acetate	TX	5225	10184802
Vinyl chloride	TX	5235	10184802
Xylene (total)	TX	5260	10184802

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10185805
1,2,4-Trichlorobenzene	TX	5155	10185805
1,2-Dichlorobenzene	TX	4610	10185805
1,2-Dinitrobenzene	TX	6155	10185805

Pace Analytical Services, LLC - Dallas, TX	**Certificate:** T104704232-19-29
	Expiration Date: 6/30/2020
400 West Bethany Drive, Suite 190 **Allen, TX 75013-3714**	**Issue Date:** 7/25/2019

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Matrix: ***Solid & Chemical Materials***

1,3-Dichlorobenzene	TX	4615	10185805
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185805
1,4-Dichlorobenzene	TX	4620	10185805
1,4-Dinitrobenzene	TX	6165	10185805
1,4-Naphthoquinone	TX	6420	10185805
1-Chloronaphthalene	TX	5790	10185805
1-Naphthylamine	TX	6425	10185805
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185805
2,3,4,6-Tetrachlorophenol	TX	6735	10185805
2,4,5-Trichlorophenol	TX	6835	10185805
2,4,6-Trichlorophenol	TX	6840	10185805
2,4-Dichlorophenol	TX	6000	10185805
2,4-Dimethylphenol	TX	6130	10185805
2,4-Dinitrophenol	TX	6175	10185805
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185805
2,6-Dichlorophenol	TX	6005	10185805
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185805
2-Acetylaminofluorene	TX	5515	10185805
2-Chloronaphthalene	TX	5795	10185805
2-Chlorophenol	TX	5800	10185805
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185805
2-Methylaniline (o-Toluidine)	TX	5145	10185805
2-Methylnaphthalene	TX	6385	10185805
2-Methylphenol (o-Cresol)	TX	6400	10185805
2-Naphthylamine	TX	6430	10185805
2-Nitroaniline	TX	6460	10185805
2-Nitrophenol	TX	6490	10185805
2-Picoline (2-Methylpyridine)	TX	5050	10185805
3,3'-Dichlorobenzidine	TX	5945	10185805
3-Methylcholanthrene	TX	6355	10185805

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Allen, TX 75013-3714

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Matrix: ***Solid & Chemical Materials***

3-Methylphenol (m-Cresol)	TX	6405	10185805
3-Nitroaniline	TX	6465	10185805
4-Aminobiphenyl	TX	5540	10185805
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185805
4-Chloro-3-methylphenol	TX	5700	10185805
4-Chloroaniline	TX	5745	10185805
4-Chlorophenyl phenylether	TX	5825	10185805
4-Methylphenol (p-Cresol)	TX	6410	10185805
4-Nitroaniline	TX	6470	10185805
4-Nitrobiphenyl	TX	6480	10185805
4-Nitrophenol	TX	6500	10185805
5,5-Diphenylhydantoin	TX	6215	10185805
5-Chloro-2-methylaniline	TX	5695	10185805
5-Nitroacenaphthene	TX	6455	10185805
5-Nitro-o-toluidine	TX	6570	10185805
7,12-Dimethylbenz(a) anthracene	TX	6115	10185805
Acenaphthene	TX	5500	10185805
Acenaphthylene	TX	5505	10185805
Acetophenone	TX	5510	10185805
Aminoazobenzene	TX	5535	10185805
Aniline	TX	5545	10185805
Anthracene	TX	5555	10185805
Azobenzene	TX	5562	10185805
Benzidine	TX	5595	10185805
Benzo(a)anthracene	TX	5575	10185805
Benzo(a)pyrene	TX	5580	10185805
Benzo(b)fluoranthene	TX	5585	10185805
Benzo(g,h,i)perylene	TX	5590	10185805
Benzo(k)fluoranthene	TX	5600	10185805
Benzoic acid	TX	5610	10185805

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Matrix: ***Solid & Chemical Materials***

Benzyl alcohol	TX	5630	10185805
bis(2-Chloroethoxy)methane	TX	5760	10185805
bis(2-Chloroethyl) ether	TX	5765	10185805
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185805
Butyl benzyl phthalate	TX	5670	10185805
Carbazole	TX	5680	10185805
Chrysene	TX	5855	10185805
Dibenz(a,h) anthracene	TX	5895	10185805
Dibenzofuran	TX	5905	10185805
Diethyl phthalate	TX	6070	10185805
Diethyl sulfate	TX	6080	10185805
Diethylstilbestrol	TX	6075	10185805
Dimethyl phthalate	TX	6135	10185805
Di-n-butyl phthalate	TX	5925	10185805
Di-n-octyl phthalate	TX	6200	10185805
Diphenylamine	TX	6205	10185805
Ethyl methanesulfonate	TX	6260	10185805
Fluoranthene	TX	6265	10185805
Fluorene	TX	6270	10185805
Hexachlorobenzene	TX	6275	10185805
Hexachlorobutadiene	TX	4835	10185805
Hexachlorocyclopentadiene	TX	6285	10185805
Hexachloroethane	TX	4840	10185805
Hexachloropropene	TX	6295	10185805
Indeno(1,2,3-cd) pyrene	TX	6315	10185805
Isodrin	TX	7725	10185805
Isophorone	TX	6320	10185805
Isosafrole	TX	6325	10185805
Mestranol	TX	6340	10185805
Methyl methanesulfonate	TX	6375	10185805

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Matrix: ***Solid & Chemical Materials***

Methylphenols, total	TX	10313	10185805
Naphthalene	TX	5005	10185805
Nitrobenzene	TX	5015	10185805
n-Nitrosodiethylamine	TX	6525	10185805
n-Nitrosodimethylamine	TX	6530	10185805
n-Nitrosodi-n-butylamine	TX	5025	10185805
n-Nitrosodi-n-propylamine	TX	6545	10185805
n-Nitrosodiphenylamine	TX	6535	10185805
n-Nitrosomethylethylamine	TX	6550	10185805
n-Nitrosomorpholine	TX	6555	10185805
n-Nitrosopiperidine	TX	6560	10185805
n-Nitrosopyrrolidine	TX	6565	10185805
o-Anisidine	TX	5550	10185805
p-Cresidine	TX	5860	10185805
Pentachlorobenzene	TX	6590	10185805
Pentachloronitrobenzene (PCNB)	TX	6600	10185805
Pentachlorophenol	TX	6605	10185805
Phenacetin	TX	6610	10185805
Phenanthrene	TX	6615	10185805
Phenol	TX	6625	10185805
Pronamide (Kerb)	TX	6650	10185805
Pyrene	TX	6665	10185805
Pyridine	TX	5095	10185805
Safrole	TX	6685	10185805

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10196802

Matrix: ***Solid & Chemical Materials***

pH	TX	1900	10196802

Method EPA 9045

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10197805
pH	TX	1900	10197805

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198808

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Sulfate	TX	2000	10199209

Method EPA 9065

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10200405

Method EPA 9095

Analyte	**AB**	**Analyte ID**	**Method ID**
Paint Filter Liquids Test	TX	10312	10204009

Method EPA 9250

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	10207202

Method SM 9221 C / 9221 E

Analyte	**AB**	**Analyte ID**	**Method ID**
Fecal coliforms (enumeration)	TX	2530	20195806

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Matrix: ***Solid & Chemical Materials***

Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

Pace Analytical Services, LLC - Dallas, TX

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Allen, TX 75013-3714

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704232-18-26
Effective Date: 10/4/2018
Expiration Date: 6/30/2019

Executive Director Texas Commission on
Environmental Quality

Texas Commission on Environmental Quality

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Issue Date: 10/4/2018

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Matrix: ***Drinking Water***

Method IDEXX Laboratories SimPlate®

Analyte	**AB**	**Analyte ID**	**Method ID**
Heterotrophic plate count	TX	2555	60032602

Method SM 9222 D (MFC Medium)

Analyte	**AB**	**Analyte ID**	**Method ID**
Fecal coliforms (enumeration)	TX	2530	20210008

Method SM 9223-IDEXX Laboratories Colilert® Test

Analyte	**AB**	**Analyte ID**	**Method ID**
Total coliforms and E. coli (P/A)	TX	2502	20212413

Method SM 9223-IDEXX Laboratories Colilert® Quanti-Tray Test

Analyte	**AB**	**Analyte ID**	**Method ID**
Escherichia coli (enumeration)	TX	2525	20211603
Total coliforms (enumeration)	TX	2500	20211603

Certificate:	**T104704232-18-26**
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Matrix: ***Non-Potable Water***

Method EPA 1010

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	TX	1780	10116606

Method EPA 120.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10006403

Method EPA 1311

Analyte	**AB**	**Analyte ID**	**Method ID**
TCLP	TX	849	10118806

Method EPA 1312

Analyte	**AB**	**Analyte ID**	**Method ID**
SPLP	TX	850	10119003

Method EPA 160.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-volatile	TX	1970	10010409

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	TX	10220	10127807

Method EPA 1666

Analyte	**AB**	**Analyte ID**	**Method ID**
Ethyl acetate	TX	4755	10128208
Isopropyl acetate	TX	4890	10128208
n-Amyl acetate	TX	4360	10128208

Method EPA 180.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	TX	2055	10011606

Method EPA 200.7

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10013806
Antimony	TX	1005	10013806

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Matrix: ***Non-Potable Water***

Arsenic	TX	1010	10013806
Barium	TX	1015	10013806
Beryllium	TX	1020	10013806
Boron	TX	1025	10013806
Cadmium	TX	1030	10013806
Calcium	TX	1035	10013806
Chromium	TX	1040	10013806
Cobalt	TX	1050	10013806
Copper	TX	1055	10013806
Iron	TX	1070	10013806
Lead	TX	1075	10013806
Magnesium	TX	1085	10013806
Manganese	TX	1090	10013806
Molybdenum	TX	1100	10013806
Nickel	TX	1105	10013806
Potassium	TX	1125	10013806
Selenium	TX	1140	10013806
Silver	TX	1150	10013806
Sodium	TX	1155	10013806
Strontium	TX	1160	10013806
Thallium	TX	1165	10013806
Tin	TX	1175	10013806
Titanium	TX	1180	10013806
Vanadium	TX	1185	10013806
Zinc	TX	1190	10013806

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605

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Matrix: ***Non-Potable Water***

Beryllium	TX	1020	10014605
Cadmium	TX	1030	10014605
Calcium	TX	1035	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605
Copper	TX	1055	10014605
Iron	TX	1070	10014605
Lead	TX	1075	10014605
Magnesium	TX	1085	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Potassium	TX	1125	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Thallium	TX	1165	10014605
Vanadium	TX	1185	10014605
Zinc	TX	1190	10014605

Method EPA 245.1

Analyte	AB	Analyte ID	Method ID
Mercury	TX	1095	10036609

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Sulfate	TX	2000	10053200

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Matrix: ***Non-Potable Water***

Method EPA 353.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrate as N	TX	1810	10067400
Nitrate-nitrite	TX	1820	10067400
Nitrite as N	TX	1840	10067400

Method EPA 420.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10079400

Method EPA 524.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Acetone (2-Propanone)	TX	4315	10088809
Methylene chloride (Dichloromethane)	TX	4975	10088809

Method EPA 6010

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10155609
Antimony	TX	1005	10155609
Arsenic	TX	1010	10155609
Barium	TX	1015	10155609
Beryllium	TX	1020	10155609
Boron	TX	1025	10155609
Cadmium	TX	1030	10155609
Calcium	TX	1035	10155609
Chromium	TX	1040	10155609
Cobalt	TX	1050	10155609
Copper	TX	1055	10155609
Iron	TX	1070	10155609
Lead	TX	1075	10155609
Magnesium	TX	1085	10155609
Manganese	TX	1090	10155609
Molybdenum	TX	1100	10155609
Nickel	TX	1105	10155609

Matrix: ***Non-Potable Water***

Potassium	TX	1125	10155609
Selenium	TX	1140	10155609
Silver	TX	1150	10155609
Sodium	TX	1155	10155609
Strontium	TX	1160	10155609
Thallium	TX	1165	10155609
Tin	TX	1175	10155609
Titanium	TX	1180	10155609
Vanadium	TX	1185	10155609
Zinc	TX	1190	10155609

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Magnesium	TX	1085	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419

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Matrix: ***Non-Potable Water***

Thallium	TX	1165	10156419
Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 608

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603
Aroclor-1248 (PCB-1248)	TX	8900	10103603
Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603
Heptachlor	TX	7685	10103603
Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603

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Matrix: ***Non-Potable Water***

Toxaphene (Chlorinated camphene)	TX	8250	10103603

Method EPA 615

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	TX	8655	10298201
2,4-D	TX	8545	10298201
2,4-DB	TX	8560	10298201
Dalapon	TX	8555	10298201
Dicamba	TX	8595	10298201
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10298201
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10298201
MCPA	TX	7775	10298201
MCPP	TX	7780	10298201
Silvex (2,4,5-TP)	TX	8650	10298201

Method EPA 624

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207
1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207
2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207

Matrix: ***Non-Potable Water***

Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,2-Dichloroethylene	TX	4645	10107207
cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
Naphthalene	TX	5005	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
Total trihalomethanes	TX	5205	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207
Vinyl chloride	TX	5235	10107207
Xylene (total)	TX	5260	10107207

Method EPA 625

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704232-18-26
Expiration Date: 6/30/2019
Issue Date: 10/4/2018

Pace Analytical Services, LLC - Dallas, TX

400 West Bethany Drive, Suite 190
Allen, TX 75013-3714

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Matrix: ***Non-Potable Water***

1,2,4-Trichlorobenzene	TX	5155	10107401
1,2-Dichlorobenzene	TX	4610	10107401
1,2-Diphenylhydrazine	TX	6220	10107401
1,3-Dichlorobenzene	TX	4615	10107401
1,4-Dichlorobenzene	TX	4620	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,3,4,6-Tetrachlorophenol	TX	6735	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401
2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401
Acenaphthylene	TX	5505	10107401
Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401

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Matrix: ***Non-Potable Water***

Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401
Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401
Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401
n-Nitrosodi-n-butylamine	TX	5025	10107401
n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401

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Matrix: ***Non-Potable Water***

Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401
Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401

Method EPA 632

Analyte	**AB**	**Analyte ID**	**Method ID**
Carbaryl (Sevin)	TX	7195	10108608

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165807

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178606
4,4'-DDE	TX	7360	10178606
4,4'-DDT	TX	7365	10178606
Aldrin	TX	7025	10178606
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178606
alpha-Chlordane	TX	7240	10178606
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178606
Chlordane (tech.)	TX	7250	10178606
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178606
Dieldrin	TX	7470	10178606
Endosulfan I	TX	7510	10178606
Endosulfan II	TX	7515	10178606
Endosulfan sulfate	TX	7520	10178606
Endrin	TX	7540	10178606
Endrin aldehyde	TX	7530	10178606

Matrix: ***Non-Potable Water***

Endrin ketone	TX	7535	10178606
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178606
gamma-Chlordane	TX	7245	10178606
Heptachlor	TX	7685	10178606
Heptachlor epoxide	TX	7690	10178606
Methoxychlor	TX	7810	10178606
Mirex	TX	7870	10178606
Toxaphene (Chlorinated camphene)	TX	8250	10178606

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179007
Aroclor-1221 (PCB-1221)	TX	8885	10179007
Aroclor-1232 (PCB-1232)	TX	8890	10179007
Aroclor-1242 (PCB-1242)	TX	8895	10179007
Aroclor-1248 (PCB-1248)	TX	8900	10179007
Aroclor-1254 (PCB-1254)	TX	8905	10179007
Aroclor-1260 (PCB-1260)	TX	8910	10179007
PCBs (total)	TX	8870	10179007

Method EPA 8141

Analyte	**AB**	**Analyte ID**	**Method ID**
Azinphos-methyl (Guthion)	TX	7075	10182000
Bolstar (Sulprofos)	TX	7125	10182000
Chlorpyrifos (Dursban)	TX	7300	10182000
Coumaphos	TX	7315	10182000
Demeton	TX	7390	10182000
Demeton-o	TX	7395	10182000
Demeton-s	TX	7385	10182000
Diazinon	TX	7410	10182000
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10182000
Dimethoate	TX	7475	10182000
Disulfoton	TX	8625	10182000

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Matrix: ***Non-Potable Water***

EPN (Phosphonothioic acid, phenyl-, O-ethyl O-(p-nitrophenyl) ester)	TX	7550	10182000
Ethoprop	TX	7570	10182000
Fensulfothion	TX	7600	10182000
Fenthion	TX	7605	10182000
Malathion	TX	7770	10182000
Merphos	TX	7785	10182000
Methyl parathion (Parathion, methyl)	TX	7825	10181803
Mevinphos	TX	7850	10182000
Naled	TX	7905	10182000
Parathion, ethyl	TX	7955	10182000
Phorate	TX	7985	10182000
Ronnel	TX	8110	10182000
Sulfotepp	TX	8155	10182000
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10182000
Tokuthion (Prothiophos)	TX	8245	10182000
Trichloronate	TX	8275	10182000

Method EPA 8151

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	TX	8655	10183207
2,4-D	TX	8545	10183207
2,4-DB	TX	8560	10183207
Dalapon	TX	8555	10183207
Dicamba	TX	8595	10183207
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183207
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183207
MCPA	TX	7775	10183207
MCPP	TX	7780	10183207
Pentachlorophenol	TX	6605	10183207
Silvex (2,4,5-TP)	TX	8650	10183207

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

1,1,1,2-Tetrachloroethane	TX	5105	10184802
1,1,1-Trichloroethane	TX	5160	10184802
1,1,2,2-Tetrachloroethane	TX	5110	10184802
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184802
1,1,2-Trichloroethane	TX	5165	10184802
1,1-Dichloroethane	TX	4630	10184802
1,1-Dichloroethylene	TX	4640	10184802
1,1-Dichloropropene	TX	4670	10184802
1,2,3-Trichlorobenzene	TX	5150	10184802
1,2,3-Trichloropropane	TX	5180	10184802
1,2,4-Trichlorobenzene	TX	5155	10184802
1,2,4-Trimethylbenzene	TX	5210	10184802
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184802
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184802
1,2-Dichlorobenzene	TX	4610	10184802
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184802
1,2-Dichloropropane	TX	4655	10184802
1,3,5-Trimethylbenzene	TX	5215	10184802
1,3-Dichlorobenzene	TX	4615	10184802
1,3-Dichloropropane	TX	4660	10184802
1,4-Dichlorobenzene	TX	4620	10184802
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184802
2,2-Dichloropropane	TX	4665	10184802
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184802
2-Chloroethyl vinyl ether	TX	4500	10184802
2-Chlorotoluene	TX	4535	10184802
2-Hexanone (MBK)	TX	4860	10184802
4-Chlorotoluene	TX	4540	10184802
4-Isopropyltoluene (p-Cymene)	TX	4915	10184802
4-Methyl-2-pentanone (MIBK)	TX	4995	10184802

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

Acetone (2-Propanone)	TX	4315	10184802
Acetonitrile	TX	4320	10184802
Acrolein (Propenal)	TX	4325	10184802
Acrylonitrile	TX	4340	10184802
Allyl chloride (3-Chloropropene)	TX	4355	10184802
Benzene	TX	4375	10184802
Benzyl chloride	TX	5635	10184802
Bromobenzene	TX	4385	10184802
Bromochloromethane	TX	4390	10184802
Bromodichloromethane	TX	4395	10184802
Bromoform	TX	4400	10184802
Carbon disulfide	TX	4450	10184802
Carbon tetrachloride	TX	4455	10184802
Chlorobenzene	TX	4475	10184802
Chlorodibromomethane	TX	4575	10184802
Chloroethane (Ethyl chloride)	TX	4485	10184802
Chloroform	TX	4505	10184802
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184802
cis-1,2-Dichloroethylene	TX	4645	10184802
cis-1,3-Dichloropropene	TX	4680	10184802
Dibromomethane (Methylene bromide)	TX	4595	10184802
Dichlorodifluoromethane (Freon-12)	TX	4625	10184802
Ethyl acetate	TX	4755	10184802
Ethyl methacrylate	TX	4810	10184802
Ethylbenzene	TX	4765	10184802
Hexachlorobutadiene	TX	4835	10184802
Hexachloroethane	TX	4840	10184802
Iodomethane (Methyl iodide)	TX	4870	10184802
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184802
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184802

Matrix: ***Non-Potable Water***

Isopropylbenzene (Cumene)	TX	4900	10184802
m+p-xylene	TX	5240	10184802
Methacrylonitrile	TX	4925	10184802
Methyl acetate	TX	4940	10184802
Methyl bromide (Bromomethane)	TX	4950	10184802
Methyl chloride (Chloromethane)	TX	4960	10184802
Methyl methacrylate	TX	4990	10184802
Methyl tert-butyl ether (MTBE)	TX	5000	10184802
Methylene chloride (Dichloromethane)	TX	4975	10184802
Naphthalene	TX	5005	10184802
n-Butylbenzene	TX	4435	10184802
n-Propylbenzene	TX	5090	10184802
o-Xylene	TX	5250	10184802
Pentachloroethane	TX	5035	10184802
Propionitrile (Ethyl cyanide)	TX	5080	10184802
sec-Butylbenzene	TX	4440	10184802
Styrene	TX	5100	10184802
tert-Butylbenzene	TX	4445	10184802
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184802
Toluene	TX	5140	10184802
trans-1,2-Dichloroethylene	TX	4700	10184802
trans-1,3-Dichloropropylene	TX	4685	10184802
trans-1,4-Dichloro-2-butene	TX	4605	10184802
Trichloroethene (Trichloroethylene)	TX	5170	10184802
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184802
Vinyl acetate	TX	5225	10184802
Vinyl chloride	TX	5235	10184802
Xylene (total)	TX	5260	10184802

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

1,2,4,5-Tetrachlorobenzene	TX	6715	10185805
1,2,4-Trichlorobenzene	TX	5155	10185805
1,2-Dichlorobenzene	TX	4610	10185805
1,2-Dinitrobenzene	TX	6155	10185805
1,3-Dichlorobenzene	TX	4615	10185805
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185805
1,4-Dichlorobenzene	TX	4620	10185805
1,4-Dinitrobenzene	TX	6165	10185805
1,4-Naphthoquinone	TX	6420	10185805
1-Chloronaphthalene	TX	5790	10185805
1-Naphthylamine	TX	6425	10185805
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185805
2,3,4,6-Tetrachlorophenol	TX	6735	10185805
2,4,5-Trichlorophenol	TX	6835	10185805
2,4,6-Trichlorophenol	TX	6840	10185805
2,4-Dichlorophenol	TX	6000	10185805
2,4-Dimethylphenol	TX	6130	10185805
2,4-Dinitrophenol	TX	6175	10185805
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185805
2,6-Dichlorophenol	TX	6005	10185805
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185805
2-Acetylaminofluorene	TX	5515	10185805
2-Chloronaphthalene	TX	5795	10185805
2-Chlorophenol	TX	5800	10185805
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185805
2-Methylaniline (o-Toluidine)	TX	5145	10185805
2-Methylnaphthalene	TX	6385	10185805
2-Methylphenol (o-Cresol)	TX	6400	10185805
2-Naphthylamine	TX	6430	10185805
2-Nitroaniline	TX	6460	10185805

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Matrix: ***Non-Potable Water***

2-Nitrophenol	TX	6490	10185805
2-Picoline (2-Methylpyridine)	TX	5050	10185805
3,3'-Dichlorobenzidine	TX	5945	10185805
3-Methylcholanthrene	TX	6355	10185805
3-Methylphenol (m-Cresol)	TX	6405	10185805
3-Nitroaniline	TX	6465	10185805
4-Aminobiphenyl	TX	5540	10185805
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185805
4-Chloro-3-methylphenol	TX	5700	10185805
4-Chloroaniline	TX	5745	10185805
4-Chlorophenyl phenylether	TX	5825	10185805
4-Dimethyl aminoazobenzene	TX	6105	10185805
4-Methylphenol (p-Cresol)	TX	6410	10185805
4-Nitroaniline	TX	6470	10185805
4-Nitrobiphenyl	TX	6480	10185805
4-Nitrophenol	TX	6500	10185805
5,5-Diphenylhydantoin	TX	6215	10185805
5-Chloro-2-methylaniline	TX	5695	10185805
5-Nitroacenaphthene	TX	6455	10185805
5-Nitro-o-toluidine	TX	6570	10185805
7,12-Dimethylbenz(a) anthracene	TX	6115	10185805
Acenaphthene	TX	5500	10185805
Acenaphthylene	TX	5505	10185805
Acetophenone	TX	5510	10185805
Aminoazobenzene	TX	5535	10185805
Aniline	TX	5545	10185805
Anthracene	TX	5555	10185805
Azobenzene	TX	5562	10185805
Benzidine	TX	5595	10185805
Benzo(a)anthracene	TX	5575	10185805

Matrix: ***Non-Potable Water***

Benzo(a)pyrene	TX	5580	10185805
Benzo(b)fluoranthene	TX	5585	10185805
Benzo(g,h,i)perylene	TX	5590	10185805
Benzo(k)fluoranthene	TX	5600	10185805
Benzoic acid	TX	5610	10185805
Benzyl alcohol	TX	5630	10185805
bis(2-Chloroethoxy)methane	TX	5760	10185805
bis(2-Chloroethyl) ether	TX	5765	10185805
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185805
Butyl benzyl phthalate	TX	5670	10185805
Carbazole	TX	5680	10185805
Chrysene	TX	5855	10185805
Dibenz(a,h) anthracene	TX	5895	10185805
Dibenzofuran	TX	5905	10185805
Diethyl phthalate	TX	6070	10185805
Diethylstilbestrol	TX	6075	10185805
Dimethyl phthalate	TX	6135	10185805
Di-n-butyl phthalate	TX	5925	10185805
Di-n-octyl phthalate	TX	6200	10185805
Diphenylamine	TX	6205	10185805
Ethyl methanesulfonate	TX	6260	10185805
Fluoranthene	TX	6265	10185805
Fluorene	TX	6270	10185805
Hexachlorobenzene	TX	6275	10185805
Hexachlorobutadiene	TX	4835	10185805
Hexachlorocyclopentadiene	TX	6285	10185805
Hexachloroethane	TX	4840	10185805
Hexachloropropene	TX	6295	10185805
Indeno(1,2,3-cd) pyrene	TX	6315	10185805
Isodrin	TX	7725	10185805

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Matrix: ***Non-Potable Water***

Isophorone	TX	6320	10185805
Isosafrole	TX	6325	10185805
Mestranol	TX	6340	10185805
Methyl methanesulfonate	TX	6375	10185805
Naphthalene	TX	5005	10185805
Nitrobenzene	TX	5015	10185805
n-Nitrosodiethylamine	TX	6525	10185805
n-Nitrosodimethylamine	TX	6530	10185805
n-Nitrosodi-n-butylamine	TX	5025	10185805
n-Nitrosodi-n-propylamine	TX	6545	10185805
n-Nitrosodiphenylamine	TX	6535	10185805
n-Nitrosomethylethylamine	TX	6550	10185805
n-Nitrosomorpholine	TX	6555	10185805
n-Nitrosopiperidine	TX	6560	10185805
n-Nitrosopyrrolidine	TX	6565	10185805
o-Anisidine	TX	5550	10185805
p-Cresidine	TX	5860	10185805
Pentachlorobenzene	TX	6590	10185805
Pentachloronitrobenzene (PCNB)	TX	6600	10185805
Pentachlorophenol	TX	6605	10185805
Phenacetin	TX	6610	10185805
Phenanthrene	TX	6615	10185805
Phenol	TX	6625	10185805
Pronamide (Kerb)	TX	6650	10185805
Pyrene	TX	6665	10185805
Pyridine	TX	5095	10185805
Safrole	TX	6685	10185805

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803

Matrix: ***Non-Potable Water***

Total cyanide	TX	1645	10193803

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	10196802

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
~~Conductivity~~	~~TX~~	~~1610~~	~~10198808~~

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10200201

Method EPA 9065

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10200405

Method IDEXX Laboratories Colilert®

Analyte	**AB**	**Analyte ID**	**Method ID**
Escherichia coli (enumeration)	TX	2525	60002600

Method SM 2120 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Color	TX	1605	20223807

Method SM 2310 B (4a)

Analyte	**AB**	**Analyte ID**	**Method ID**
Acidity, as CaCO3	TX	1500	20002806

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Matrix: ***Non-Potable Water***

Method SM 2320 B

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2340 B

Analyte	AB	Analyte ID	Method ID
Total hardness as CaCO3	TX	1755	20046008

Method SM 2540 B

Analyte	AB	Analyte ID	Method ID
Residue-total (total solids)	TX	1950	20004608

Method SM 2540 C

Analyte	AB	Analyte ID	Method ID
Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	AB	Analyte ID	Method ID
Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 2540 F

Analyte	AB	Analyte ID	Method ID
Residue-settleable	TX	1965	20005009

Method SM 3500-Cr B

Analyte	AB	Analyte ID	Method ID
Chromium (VI)	TX	1045	20065809

Method SM 3500-Fe D

Analyte	AB	Analyte ID	Method ID
Iron	TX	1070	20009603

Method SM 4500-CN^- E

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	20021209

Method SM 4500-CN^- G

Analyte	AB	Analyte ID	Method ID
Amenable cyanide	TX	1510	20021607

Method SM 4500-H+ B

Analyte	AB	Analyte ID	Method ID

Matrix: ***Non-Potable Water***

pH	TX	1900	20104603

Method SM 4500-NH3 H

Analyte	**AB**	**Analyte ID**	**Method ID**
Ammonia as N	TX	1515	20023409

Method SM 4500-O C

Analyte	**AB**	**Analyte ID**	**Method ID**
~~Oxygen, dissolved~~	~~TX~~	~~1880~~	~~20025201~~

Method SM 4500-P E

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	TX	1870	20025803
Phosphorus	TX	1910	20025803

Method SM 4500-$S2^-$ F

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	TX	2005	20126209

Method SM 5210 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5220 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	20027809

Method SM 5310 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	20138209

Method SM 5540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Surfactants - MBAS	TX	2025	20144405

Method SM 9222 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total coliforms (enumeration)	TX	2500	20198009

Method SM 9222 D

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

Fecal coliforms (enumeration)	TX	2530	20037405

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

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Matrix: ***Solid & Chemical Materials***

Method EPA 1010

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	TX	1780	10116606

Method EPA 1030

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	TX	1780	10117201

Method EPA 1311

Analyte	**AB**	**Analyte ID**	**Method ID**
TCLP	TX	849	10118806

Method EPA 1312

Analyte	**AB**	**Analyte ID**	**Method ID**
SPLP	TX	850	10119003

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Sulfate	TX	2000	10053200

Method EPA 353.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrate as N	TX	1810	10067604
Nitrate-nitrite	TX	1820	10067604
Nitrite as N	TX	1840	10067604

Method EPA 6010

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10155609
Antimony	TX	1005	10155609
Arsenic	TX	1010	10155609

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Matrix: ***Solid & Chemical Materials***

Barium	TX	1015	10155609
Beryllium	TX	1020	10155609
Boron	TX	1025	10155609
Cadmium	TX	1030	10155609
Calcium	TX	1035	10155609
Chromium	TX	1040	10155609
Cobalt	TX	1050	10155609
Copper	TX	1055	10155609
Iron	TX	1070	10155609
Lead	TX	1075	10155609
Magnesium	TX	1085	10155609
Manganese	TX	1090	10155609
Molybdenum	TX	1100	10155609
Nickel	TX	1105	10155609
Potassium	TX	1125	10155609
Selenium	TX	1140	10155609
Silver	TX	1150	10155609
Strontium	TX	1160	10155609
Thallium	TX	1165	10155609
Tin	TX	1175	10155609
Titanium	TX	1180	10155609
Vanadium	TX	1185	10155609
Zinc	TX	1190	10155609

Method EPA 6020

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419

Matrix: ***Solid & Chemical Materials***

Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Thallium	TX	1165	10156419
Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10166208

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178606
4,4'-DDE	TX	7360	10178606
4,4'-DDT	TX	7365	10178606
Aldrin	TX	7025	10178606
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178606
alpha-Chlordane	TX	7240	10178606
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178606
Chlordane (tech.)	TX	7250	10178606
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178606

Matrix: ***Solid & Chemical Materials***

Dieldrin	TX	7470	10178606
Endosulfan I	TX	7510	10178606
Endosulfan II	TX	7515	10178606
Endosulfan sulfate	TX	7520	10178606
Endrin	TX	7540	10178606
Endrin aldehyde	TX	7530	10178606
Endrin ketone	TX	7535	10178606
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178606
gamma-Chlordane	TX	7245	10178606
Heptachlor	TX	7685	10178606
Heptachlor epoxide	TX	7690	10178606
Methoxychlor	TX	7810	10178606
Mirex	TX	7870	10178606
Toxaphene (Chlorinated camphene)	TX	8250	10178606

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
Aroclor-1016 (PCB-1016)	TX	8880	10179007
Aroclor-1221 (PCB-1221)	TX	8885	10179007
Aroclor-1232 (PCB-1232)	TX	8890	10179007
Aroclor-1242 (PCB-1242)	TX	8895	10179007
Aroclor-1248 (PCB-1248)	TX	8900	10179007
Aroclor-1254 (PCB-1254)	TX	8905	10179007
Aroclor-1260 (PCB-1260)	TX	8910	10179007
PCBs (total)	TX	8870	10179007

Method EPA 8141

Analyte	**AB**	**Analyte ID**	**Method ID**
Azinphos-methyl (Guthion)	TX	7075	10182000
Bolstar (Sulprofos)	TX	7125	10182000
Chlorpyrifos (Dursban)	TX	7300	10182000
Coumaphos	TX	7315	10182000
Demeton	TX	7390	10182000

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Matrix: ***Solid & Chemical Materials***

Demeton-o	TX	7395	10182000
Demeton-s	TX	7385	10182000
Diazinon	TX	7410	10182000
Dichlorovos (DDVP, Dichlorvos)	TX	8610	10182000
Dimethoate	TX	7475	10182000
Disulfoton	TX	8625	10182000
EPN (Phosphonothioic acid, phenyl-, O-ethyl O-(p-nitrophenyl) ester)	TX	7550	10182000
Ethoprop	TX	7570	10182000
Fensulfothion	TX	7600	10182000
Fenthion	TX	7605	10182000
Malathion	TX	7770	10182000
Merphos	TX	7785	10182000
Methyl parathion (Parathion, methyl)	TX	7825	10181803
Mevinphos	TX	7850	10182000
Naled	TX	7905	10182000
Parathion, ethyl	TX	7955	10182000
Phorate	TX	7985	10182000
Ronnel	TX	8110	10182000
Sulfotepp	TX	8155	10182000
Tetrachlorvinphos (Stirophos, Gardona)	TX	8197	10182000
Tokuthion (Prothiophos)	TX	8245	10182000
Trichloronate	TX	8275	10182000

Method EPA 8151

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	TX	8655	10183207
2,4-D	TX	8545	10183207
2,4-DB	TX	8560	10183207
Dalapon	TX	8555	10183207
Dicamba	TX	8595	10183207
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183207

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Matrix: ***Solid & Chemical Materials***

Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183207
MCPA	TX	7775	10183207
MCPP	TX	7780	10183207
Pentachlorophenol	TX	6605	10183207
Silvex (2,4,5-TP)	TX	8650	10183207

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184802
1,1,1-Trichloroethane	TX	5160	10184802
1,1,2,2-Tetrachloroethane	TX	5110	10184802
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184802
1,1,2-Trichloroethane	TX	5165	10184802
1,1-Dichloroethane	TX	4630	10184802
1,1-Dichloroethylene	TX	4640	10184802
1,1-Dichloropropene	TX	4670	10184802
1,2,3-Trichlorobenzene	TX	5150	10184802
1,2,3-Trichloropropane	TX	5180	10184802
1,2,4-Trichlorobenzene	TX	5155	10184802
1,2,4-Trimethylbenzene	TX	5210	10184802
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184802
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184802
1,2-Dichlorobenzene	TX	4610	10184802
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184802
1,2-Dichloropropane	TX	4655	10184802
1,3,5-Trimethylbenzene	TX	5215	10184802
1,3-Dichlorobenzene	TX	4615	10184802
1,3-Dichloropropane	TX	4660	10184802
1,4-Dichlorobenzene	TX	4620	10184802
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184802
2,2-Dichloropropane	TX	4665	10184802

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Matrix: ***Solid & Chemical Materials***

2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184802
2-Chloroethyl vinyl ether	TX	4500	10184802
2-Chlorotoluene	TX	4535	10184802
2-Hexanone (MBK)	TX	4860	10184802
4-Chlorotoluene	TX	4540	10184802
4-Isopropyltoluene (p-Cymene)	TX	4915	10184802
4-Methyl-2-pentanone (MIBK)	TX	4995	10184802
Acetone (2-Propanone)	TX	4315	10184802
Acetonitrile	TX	4320	10184802
Acrolein (Propenal)	TX	4325	10184802
Acrylonitrile	TX	4340	10184802
Allyl chloride (3-Chloropropene)	TX	4355	10184802
Benzene	TX	4375	10184802
Benzyl chloride	TX	5635	10184802
Bromobenzene	TX	4385	10184802
Bromochloromethane	TX	4390	10184802
Bromodichloromethane	TX	4395	10184802
Bromoform	TX	4400	10184802
Carbon disulfide	TX	4450	10184802
Carbon tetrachloride	TX	4455	10184802
Chlorobenzene	TX	4475	10184802
Chlorodibromomethane	TX	4575	10184802
Chloroethane (Ethyl chloride)	TX	4485	10184802
Chloroform	TX	4505	10184802
Chloroprene (2-Chloro-1,3-butadiene)	TX	4525	10184802
cis-1,2-Dichloroethylene	TX	4645	10184802
cis-1,3-Dichloropropene	TX	4680	10184802
Dibromomethane (Methylene bromide)	TX	4595	10184802
Dichlorodifluoromethane (Freon-12)	TX	4625	10184802
Epichlorohydrin (1-Chloro-2,3-epoxypropane)	TX	4745	10184802

Matrix: ***Solid & Chemical Materials***

Ethyl acetate	TX	4755	10184802
Ethyl methacrylate	TX	4810	10184802
Ethylbenzene	TX	4765	10184802
Hexachlorobutadiene	TX	4835	10184802
Hexachloroethane	TX	4840	10184802
Iodomethane (Methyl iodide)	TX	4870	10184802
Isobutyl alcohol (2-Methyl-1-propanol)	TX	4875	10184802
Isopropyl alcohol (2-Propanol, Isopropanol)	TX	4895	10184802
Isopropylbenzene (Cumene)	TX	4900	10184802
m+p-xylene	TX	5240	10184802
Methacrylonitrile	TX	4925	10184802
Methyl acetate	TX	4940	10184802
Methyl bromide (Bromomethane)	TX	4950	10184802
Methyl chloride (Chloromethane)	TX	4960	10184802
Methyl methacrylate	TX	4990	10184802
Methyl tert-butyl ether (MTBE)	TX	5000	10184802
Methylene chloride (Dichloromethane)	TX	4975	10184802
Naphthalene	TX	5005	10184802
n-Butylbenzene	TX	4435	10184802
n-Propylbenzene	TX	5090	10184802
o-Xylene	TX	5250	10184802
Pentachloroethane	TX	5035	10184802
Propionitrile (Ethyl cyanide)	TX	5080	10184802
sec-Butylbenzene	TX	4440	10184802
Styrene	TX	5100	10184802
tert-Butylbenzene	TX	4445	10184802
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184802
Toluene	TX	5140	10184802
trans-1,2-Dichloroethylene	TX	4700	10184802
trans-1,3-Dichloropropylene	TX	4685	10184802

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Matrix: ***Solid & Chemical Materials***

trans-1,4-Dichloro-2-butene	TX	4605	10184802
Trichloroethene (Trichloroethylene)	TX	5170	10184802
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184802
Vinyl acetate	TX	5225	10184802
Vinyl chloride	TX	5235	10184802
Xylene (total)	TX	5260	10184802

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10185805
1,2,4-Trichlorobenzene	TX	5155	10185805
1,2-Dichlorobenzene	TX	4610	10185805
1,2-Dinitrobenzene	TX	6155	10185805
1,3-Dichlorobenzene	TX	4615	10185805
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185805
1,4-Dichlorobenzene	TX	4620	10185805
1,4-Dinitrobenzene	TX	6165	10185805
1,4-Naphthoquinone	TX	6420	10185805
1-Chloronaphthalene	TX	5790	10185805
1-Naphthylamine	TX	6425	10185805
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185805
2,3,4,6-Tetrachlorophenol	TX	6735	10185805
2,4,5-Trichlorophenol	TX	6835	10185805
2,4,6-Trichlorophenol	TX	6840	10185805
2,4-Dichlorophenol	TX	6000	10185805
2,4-Dimethylphenol	TX	6130	10185805
2,4-Dinitrophenol	TX	6175	10185805
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185805
2,6-Dichlorophenol	TX	6005	10185805
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185805
2-Acetylaminofluorene	TX	5515	10185805

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Matrix: ***Solid & Chemical Materials***

2-Chloronaphthalene	TX	5795	10185805
2-Chlorophenol	TX	5800	10185805
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185805
2-Methylaniline (o-Toluidine)	TX	5145	10185805
2-Methylnaphthalene	TX	6385	10185805
2-Methylphenol (o-Cresol)	TX	6400	10185805
2-Naphthylamine	TX	6430	10185805
2-Nitroaniline	TX	6460	10185805
2-Nitrophenol	TX	6490	10185805
2-Picoline (2-Methylpyridine)	TX	5050	10185805
3,3'-Dichlorobenzidine	TX	5945	10185805
3-Methylcholanthrene	TX	6355	10185805
3-Methylphenol (m-Cresol)	TX	6405	10185805
3-Nitroaniline	TX	6465	10185805
4-Aminobiphenyl	TX	5540	10185805
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185805
4-Chloro-3-methylphenol	TX	5700	10185805
4-Chloroaniline	TX	5745	10185805
4-Chlorophenyl phenylether	TX	5825	10185805
4-Methylphenol (p-Cresol)	TX	6410	10185805
4-Nitroaniline	TX	6470	10185805
4-Nitrobiphenyl	TX	6480	10185805
4-Nitrophenol	TX	6500	10185805
5,5-Diphenylhydantoin	TX	6215	10185805
5-Chloro-2-methylaniline	TX	5695	10185805
5-Nitroacenaphthene	TX	6455	10185805
5-Nitro-o-toluidine	TX	6570	10185805
7,12-Dimethylbenz(a) anthracene	TX	6115	10185805
Acenaphthene	TX	5500	10185805
Acenaphthylene	TX	5505	10185805

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704232-18-26
Expiration Date: 6/30/2019
Issue Date: 10/4/2018

Pace Analytical Services, LLC - Dallas, TX

400 West Bethany Drive, Suite 190
Allen, TX 75013-3714

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Solid & Chemical Materials***

Acetophenone	TX	5510	10185805
Aminoazobenzene	TX	5535	10185805
Aniline	TX	5545	10185805
Anthracene	TX	5555	10185805
Azobenzene	TX	5562	10185805
Benzidine	TX	5595	10185805
Benzo(a)anthracene	TX	5575	10185805
Benzo(a)pyrene	TX	5580	10185805
Benzo(b)fluoranthene	TX	5585	10185805
Benzo(g,h,i)perylene	TX	5590	10185805
Benzo(k)fluoranthene	TX	5600	10185805
Benzoic acid	TX	5610	10185805
Benzyl alcohol	TX	5630	10185805
bis(2-Chloroethoxy)methane	TX	5760	10185805
bis(2-Chloroethyl) ether	TX	5765	10185805
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185805
Butyl benzyl phthalate	TX	5670	10185805
Carbazole	TX	5680	10185805
Chrysene	TX	5855	10185805
Dibenz(a,h) anthracene	TX	5895	10185805
Dibenzofuran	TX	5905	10185805
Diethyl phthalate	TX	6070	10185805
Diethyl sulfate	TX	6080	10185805
Diethylstilbestrol	TX	6075	10185805
Dimethyl phthalate	TX	6135	10185805
Di-n-butyl phthalate	TX	5925	10185805
Di-n-octyl phthalate	TX	6200	10185805
Diphenylamine	TX	6205	10185805
Ethyl methanesulfonate	TX	6260	10185805
Fluoranthene	TX	6265	10185805

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704232-18-26
Expiration Date: 6/30/2019
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Pace Analytical Services, LLC - Dallas, TX

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Matrix: ***Solid & Chemical Materials***

Fluorene	TX	6270	10185805
Hexachlorobenzene	TX	6275	10185805
Hexachlorobutadiene	TX	4835	10185805
Hexachlorocyclopentadiene	TX	6285	10185805
Hexachloroethane	TX	4840	10185805
Hexachloropropene	TX	6295	10185805
Indeno(1,2,3-cd) pyrene	TX	6315	10185805
Isodrin	TX	7725	10185805
Isophorone	TX	6320	10185805
Isosafrole	TX	6325	10185805
Mestranol	TX	6340	10185805
Methyl methanesulfonate	TX	6375	10185805
Methylphenols, total	TX	10313	10185805
Naphthalene	TX	5005	10185805
Nitrobenzene	TX	5015	10185805
n-Nitrosodiethylamine	TX	6525	10185805
n-Nitrosodimethylamine	TX	6530	10185805
n-Nitrosodi-n-butylamine	TX	5025	10185805
n-Nitrosodi-n-propylamine	TX	6545	10185805
n-Nitrosodiphenylamine	TX	6535	10185805
n-Nitrosomethylethylamine	TX	6550	10185805
n-Nitrosomorpholine	TX	6555	10185805
n-Nitrosopiperidine	TX	6560	10185805
n-Nitrosopyrrolidine	TX	6565	10185805
o-Anisidine	TX	5550	10185805
p-Cresidine	TX	5860	10185805
Pentachlorobenzene	TX	6590	10185805
Pentachloronitrobenzene (PCNB)	TX	6600	10185805
Pentachlorophenol	TX	6605	10185805
Phenacetin	TX	6610	10185805

Certificate:	**T104704232-18-26**
Expiration Date:	**6/30/2019**
Issue Date:	**10/4/2018**

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Matrix: ***Solid & Chemical Materials***

Phenanthrene	TX	6615	10185805
Phenol	TX	6625	10185805
Pronamide (Kerb)	TX	6650	10185805
Pyrene	TX	6665	10185805
Pyridine	TX	5095	10185805
Safrole	TX	6685	10185805

Method EPA 9014

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193803
Total cyanide	TX	1645	10193803

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10196802
pH	TX	1900	10196802

Method EPA 9045

Analyte	**AB**	**Analyte ID**	**Method ID**
Corrosivity	TX	1615	10197805
pH	TX	1900	10197805

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198808

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Sulfate	TX	2000	10199209

Texas Commission on Environmental Quality

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Matrix: ***Solid & Chemical Materials***

Method EPA 9065

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10200405

Method EPA 9095

Analyte	AB	Analyte ID	Method ID
Paint Filter Liquids Test	TX	10312	10204009

Method SM 9221 C / 9221 E

Analyte	AB	Analyte ID	Method ID
Fecal coliforms (enumeration)	TX	2530	20195806

Method TCEQ 1005

Analyte	AB	Analyte ID	Method ID
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

City of Fort Worth Water Department Centralized Water & Wastewater Laboratory

2600 SE Loop 820
Fort Worth, TX 76140-1010

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: T104704200-19-21
Effective Date: 11/1/2019
Expiration Date: 10/31/2020

Executive Director Texas Commission on Environmental Quality

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

City of Fort Worth Water Department Centralized Water & Wastewater Laboratory	**Certificate:**	**T104704200-19-21**
	Expiration Date:	**10/31/2020**
2600 SE Loop 820 **Fort Worth, TX 76140-1010**	**Issue Date:**	**11/1/2019**

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Drinking Water***

Method EPA 200.8

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Cadmium	TX	1030	10014605
Chromium	TX	1040	10014605
Copper	TX	1055	10014605
Lead	TX	1075	10014605
Manganese	TX	1090	10014605
Mercury	TX	1095	10014605
Nickel	TX	1105	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Thallium	TX	1165	10014605
Zinc	TX	1190	10014605

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrite as N	TX	1840	10053200
Sulfate	TX	2000	10053200

Method EPA 300.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromate	TX	1535	10275602
Bromide	TX	1540	10275602

Method EPA 335.4

Analyte	**AB**	**Analyte ID**	**Method ID**

Certificate:	**T104704200-19-21**
Expiration Date:	**10/31/2020**
Issue Date:	**11/1/2019**

City of Fort Worth Water Department Centralized Water & Wastewater Laboratory

2600 SE Loop 820
Fort Worth, TX 76140-1010

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Matrix: ***Drinking Water***

Total cyanide	TX	1645	10061402

Method EPA 353.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrite as N	TX	1840	10067604

Method EPA 375.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10073800

Method EPA 524.2

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1-Trichloroethane	TX	5160	10088809
1,1,2-Trichloroethane	TX	5165	10088809
1,1-Dichloroethylene	TX	4640	10088809
1,2,4-Trichlorobenzene	TX	5155	10088809
1,2-Dichlorobenzene	TX	4610	10088809
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10088809
1,2-Dichloropropane	TX	4655	10088809
1,4-Dichlorobenzene	TX	4620	10088809
Benzene	TX	4375	10088809
Carbon tetrachloride	TX	4455	10088809
Chlorobenzene	TX	4475	10088809
cis-1,2-Dichloroethylene	TX	4645	10088809
Ethylbenzene	TX	4765	10088809
m+p-xylene	TX	5240	10088809
Methylene chloride (Dichloromethane)	TX	4975	10088809
o-Xylene	TX	5250	10088809
Styrene	TX	5100	10088809
Tetrachloroethylene (Perchloroethylene)	TX	5115	10088809
Toluene	TX	5140	10088809
Total trihalomethanes	TX	5205	10088809
trans-1,2-Dichloroethylene	TX	4700	10088809
Trichloroethene (Trichloroethylene)	TX	5170	10088809

Texas Commission on Environmental Quality

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City of Fort Worth Water Department Centralized Water & Wastewater Laboratory

2600 SE Loop 820
Fort Worth, TX 76140-1010

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Matrix: ***Drinking Water***

Vinyl chloride	TX	5235	10088809
Xylene (total)	TX	5260	10088809

Method EPA 525.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Atrazine	TX	7065	10090003

Method EPA 552.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Total haloacetic acids	TX	9414	10095804

Method SM 2340 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total hardness as CaCO3	TX	1755	20047001

Method SM 2510 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	20048004

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	20049803

Method SM 4500-F^- C

Analyte	**AB**	**Analyte ID**	**Method ID**
Fluoride	TX	1730	20101808

Method SM 9215 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Heterotrophic plate count	TX	2555	20180001

Method SM 9222 D (MFC Medium)

Analyte	**AB**	**Analyte ID**	**Method ID**
Fecal coliforms (enumeration)	TX	2530	20210008

Method SM 9223-IDEXX Laboratories Colilert® Test

Analyte	**AB**	**Analyte ID**	**Method ID**
Total coliforms and E. coli (P/A)	TX	2502	20212413

Texas Commission on Environmental Quality

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City of Fort Worth Water Department Centralized Water & Wastewater Laboratory

2600 SE Loop 820
Fort Worth, TX 76140-1010

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Matrix: ***Drinking Water***

Method SM 9223-IDEXX Laboratories Colilert® Quanti-Tray Test

Analyte	AB	Analyte ID	Method ID
Escherichia coli (enumeration)	TX	2525	20211603
Total coliforms (enumeration)	TX	2500	20211603

Method SM 9223-IDEXX Laboratories Colilert®-18 Test

Analyte	AB	Analyte ID	Method ID
Total coliforms and E. coli (P/A)	TX	2502	20214602

Method SM 9223-IDEXX Laboratories Colilert®-18 Quanti-Tray Test

Analyte	AB	Analyte ID	Method ID
Escherichia coli (enumeration)	TX	2525	20211603
Total coliforms (enumeration)	TX	2500	20211603

City of Fort Worth Water Department Centralized Water & Wastewater Laboratory	Certificate:	T104704200-19-21
	Expiration Date:	10/31/2020
2600 SE Loop 820 Fort Worth, TX 76140-1010	Issue Date:	11/1/2019

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Matrix: *Non-Potable Water*

Method EPA 130.1

Analyte	AB	Analyte ID	Method ID
Total hardness as CaCO3	TX	1755	10006801

Method EPA 1664

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	TX	10220	10127807

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Cadmium	TX	1030	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605
Copper	TX	1055	10014605
Iron	TX	1070	10014605
Lead	TX	1075	10014605
Manganese	TX	1090	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Strontium	TX	1160	10014605
Thallium	TX	1165	10014605
Tin	TX	1175	10014605
Titanium	TX	1180	10014605
Vanadium	TX	1185	10014605

Certificate:	**T104704200-19-21**
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Fort Worth, TX 76140-1010

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Matrix: ***Non-Potable Water***

Zinc	TX	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10036609

Method EPA 245.7

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10038003

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 300.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10275602

Method EPA 310.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	10055206

Method EPA 335.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Total cyanide	TX	1645	10061402

Method EPA 351.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	TX	1790	10065404

Method EPA 353.2

Analyte	**AB**	**Analyte ID**	**Method ID**
Nitrite as N	TX	1840	10067400

City of Fort Worth Water Department Centralized Water & Wastewater Laboratory

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Matrix: ***Non-Potable Water***

Method EPA 365.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Orthophosphate as P	TX	1870	10070005

Method EPA 365.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Phosphorus	TX	1910	10071202

Method EPA 375.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfate	TX	2000	10073800

Method EPA 524.2

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2-Dichlorobenzene	TX	4610	10088809
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10088809
4-Methyl-2-pentanone (MIBK)	TX	4995	10088809
Acetone (2-Propanone)	TX	4315	10088809
Benzene	TX	4375	10088809
Chlorobenzene	TX	4475	10088809
Chloroform	TX	4505	10088809
Methylene chloride (Dichloromethane)	TX	4975	10088809
Toluene	TX	5140	10088809

Method EPA 608

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603

Aroclor-1248 (PCB-1248)	TX	8900	10103603
Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
Endrin ketone	TX	7535	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603
Heptachlor	TX	7685	10103603
Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603
Toxaphene (Chlorinated camphene)	TX	8250	10103603

Method EPA 624

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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Matrix: ***Non-Potable Water***

1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207
2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207
Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207
Vinyl chloride	TX	5235	10107207
Xylene (total)	TX	5260	10107207

Texas Commission on Environmental Quality

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Matrix: ***Non-Potable Water***

Method EPA 625

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401
1,2,4-Trichlorobenzene	TX	5155	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401
2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401
Acenaphthylene	TX	5505	10107401
Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401
Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704200-19-21
Expiration Date: 10/31/2020
Issue Date: 11/1/2019

City of Fort Worth Water Department Centralized Water & Wastewater Laboratory

2600 SE Loop 820
Fort Worth, TX 76140-1010

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401
Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401
n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401
Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401

Matrix: ***Non-Potable Water***

Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401
Method HACH 8000			
Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	60003001
Method SM 2130 B			
Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	TX	2055	20042200
Method SM 2320 B			
Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	20045005
Method SM 2340 C			
Analyte	**AB**	**Analyte ID**	**Method ID**
Total hardness as CaCO3	TX	1755	20047001
Method SM 2510 B			
Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	20048004
Method SM 2540 B			
Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	TX	1950	20004608
Method SM 2540 C			
Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	20049803
Method SM 2540 D			
Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	TX	1960	20004802
Method SM 2540 F			
Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-settleable	TX	1965	20005009
Method SM 3500-Ca B			
Analyte	**AB**	**Analyte ID**	**Method ID**
Calcium	TX	1035	20064602

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

City of Fort Worth Water Department Centralized Water & Wastewater Laboratory

2600 SE Loop 820
Fort Worth, TX 76140-1010

Certificate: T104704200-19-21
Expiration Date: 10/31/2020
Issue Date: 11/1/2019

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Matrix: ***Non-Potable Water***

Method SM 4500-Cl F

Analyte	AB	Analyte ID	Method ID
Total residual chlorine	TX	1940	20080482

Method SM 4500-Cl$^-$ B

Analyte	AB	Analyte ID	Method ID
Chloride	TX	1575	20083801

Method SM 4500-Cl$^-$ E

Analyte	AB	Analyte ID	Method ID
Chloride	TX	1575	20019209

Method SM 4500-F$^-$ C

Analyte	AB	Analyte ID	Method ID
Fluoride	TX	1730	20101808

Method SM 4500-H+ B

Analyte	AB	Analyte ID	Method ID
pH	TX	1900	20104603

Method SM 4500-NH3 B

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	20022804

Method SM 4500-NH3 D

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	20108809

Method SM 4500-NO3 H

Analyte	AB	Analyte ID	Method ID
Nitrate-nitrite	TX	1820	20024606

Method SM 5210 B

Analyte	AB	Analyte ID	Method ID
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5310 B

Analyte	AB	Analyte ID	Method ID
Total Organic Carbon (TOC)	TX	2040	20137206

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

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City of Fort Worth Water Department Centralized Water & Wastewater Laboratory

2600 SE Loop 820
Fort Worth, TX 76140-1010

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Matrix: ***Non-Potable Water***

Method SM 9222 D

Analyte	AB	Analyte ID	Method ID
Fecal coliforms (enumeration)	TX	2530	20037405

Method SM 9223 B

Analyte	AB	Analyte ID	Method ID
Escherichia coli (enumeration)	TX	2525	20211205

John Bel Edwards
GOVERNOR

Rebekah E. Gee MD, MPH
SECRETARY

State of Louisiana

Louisiana Department of Health
Office of Public Health

November 19, 2019

Dr. Connie Dunn
City of Fort Worth Water Department
Centralized Water & Wastewater Laboratory
2600 SE Loop 820
Fort Worth, TX 76140

LA015

Dear Dr. Dunn:

The requirements for maintaining your certification status for the State of Louisiana are outlined in the Louisiana Administrative Code (LAC) for the Accreditation of Laboratories Conducting Drinking Water Analyses located in LAC 48:V.Chapter 80, LAC 51:XII.101 and 301. They include but are not limited to:

1. Satisfactory analysis of periodic performance evaluation samples;
2. Use of methodologies sanctioned by the Safe Drinking Water Act or otherwise approved by the U.S. EPA for the analysis of drinking water;
3. Immediate notification to the certifying authority of any major changes in laboratory personnel, equipment, or location;
4. Satisfactory on-site evaluation;
5. Payment of appropriate fees.

Your laboratory has chosen the State of Texas and the State of Louisiana as its primary TNI accreditation bodies. Based on the criteria above and the Texas accreditation, your laboratory is granted this **2020 Certificate of Laboratory Accreditation** for all the parameters listed. The certificate must be conspicuously displayed in the laboratory in a location visible to the public.

If there are any questions, please contact me at Grant.Aucoin@LA.Gov or (225) 219-5202.

Sincerely,

Grant Aucoin
Laboratory Certification Program Manager

Enclosures

Office of Public Health Laboratory • 1209 Leesville Avenue • Baton Rouge, Louisiana 70802
Phone: (225) 219-5200 • Fax: (225) 219-4903 • www.ldh.la.gov/lab
An Equal Opportunity Employer

STATE OF LOUISIANA

DEPARTMENT OF HEALTH
OFFICE OF PUBLIC HEALTH

CITY OF FORT WORTH
WATER DEPARTMENT
CENTRALIZED
WATER & WASTEWATER LABORATORY

2600 SE Loop 820

Fort Worth, TX 76140

is accredited by the State of Louisiana in accordance with
the 2009 TNI Standard and/or Department of Health regulations
Louisiana Administrative Code 48:V.Chapter 80 and
Louisiana Administrative Code 51:XII.101 and 301

Scope of accreditation is limited to the
"TNI Accredited Fields of Testing"
which accompany this certificate

Continued accredited status depends on successful
ongoing participation in the program

CERTIFICATE NUMBER: LA015
EFFECTIVE DATE: January 1, 2020
EXPIRATION DATE: December 31, 2020

Richard Tulley

Richard T. Tulley, Ph. D,
Public Health Laboratory Director
1209 Leesville Avenue
Baton Rouge, Louisiana 70802

Grant Aucoin
Laboratory Accreditation Program
Manager

subject to forfeiture or revocation

Louisiana Department of Health
Office of Public Health
1209 Leesville Avenue
Baton Rouge, LA 70802
(225) 219-5202

Louisiana Accreditation - 2020

City of Fort Worth Water Department located in Fort Worth, TX
meets all of the criteria necessary for ACCREDITATION by the State of Louisiana and The NELAC Institute (TNI) for the analysis of drinking water for the following contaminants:

Drinking Water Parameters

Analyte	Method	Primary AB	Method Revision # or date	Technology Description	TNI Method Code	TNI Analyte Code
Aluminum	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1000
Antimony	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1005
Arsenic	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1010
Barium	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1015
Beryllium	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1020
Bromate	EPA 300.1	TX	rev 1.0	IC-COND	10275602	1535
Bromide	EPA 300.1	TX	rev 1.0	IC-COND	10275602	1540
Cadmium	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1030
Chloride	EPA 300.0	TX	rev 2.1	IC-COND	10053200	1575
Chromium	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1040
Conductivity	SM 2510 B	TX	22nd ed.	COND	20048413	1610
Copper	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1055
Cyanide	EPA 335.4	TX	rev 1.0	AUTO	10061402	1645

Certificate #: LA015
Issue Date: 11/25/2019
Effective Date: 1/1/2020
Expires: 12/31/2020

Drinking Water Parameters

Analyte	Method	Primary AB	Method Revision # or date	Technology Description	TNI Method Code	TNI Analyte Code
Fluoride	EPA 300.0	TX	rev 2.1	IC-COND	10053200	1730
Fluoride	SM 4500-F- C	TX	22nd ed.	ISE	20102210	1730
Lead	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1075
Manganese	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1090
Mercury	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1095
Nickel	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1105
Nitrate as N	EPA 300.0	TX	rev 2.1	IC-COND	10053200	1810
Nitrite as N	EPA 300.0	TX	rev 2.1	IC-COND	10053200	1840
Nitrite as N	EPA 353.2	TX	rev 2.0	AUTO	10067604	1840
Orthophosphate as P	EPA 300.0	LA	rev 2.1	IC-COND	10053200	1870
Selenium	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1140
Silver	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1150
Sulfate	EPA 300.0	TX	rev 2.1	IC-COND	10053200	2000
Thallium	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1165
Turbidity	SM 2130 B	LA	22nd ed.	TURB	20042619	2055
Zinc	EPA 200.8	TX	rev 5.4	ICP-MS	10014605	1190
1,1,1,2-Tetrachloroethane	EPA 524.2	LA	rev 4.1	GC-MS	10088809	5105
1,1,1-Trichloroethane	EPA 524.2	TX	rev 4.1	GC-MS	10088809	5160
1,1,2,2-Tetrachloroethane	EPA 524.2	LA	rev 4.1	GC-MS	10088809	5110
1,1,2-Trichloroethane	EPA 524.2	TX	rev 4.1	GC-MS	10088809	5165
1,1-Dichloroethylene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4640
1,1-Dichloropropene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4670

Drinking Water Parameters

Analyte	Method	Primary AB	Method Revision # or date	Technology Description	TNI Method Code	TNI Analyte Code
1,2,3-Trichlorobenzene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	5150
1,2,3-Trichloropropane	EPA 524.2	LA	rev 4.1	GC-MS	10088809	5180
1,2,4-Trichlorobenzene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	5155
1,2,4-Trimethylbenzene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	5210
1,2-Dichlorobenzene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4610
1,2-Dichloroethane	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4635
1,2-Dichloropropane	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4655
1,3,5-Trimethylbenzene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	5215
1,3-Dichlorobenzene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4615
1,3-Dichloropropane	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4660
1,4-Dichlorobenzene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4620
2,2-Dichloropropane	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4665
2-Chlorotoluene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4535
4-Chlorotoluene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4540
4-Isopropyltoluene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4910
Atrazine	EPA 525.2	TX	rev 2.0	GC-MS	10090003	7065
Benzene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4375
Bromobenzene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4385
Bromochloromethane	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4390
Carbon Tetrachloride	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4455
Chlorobenzene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4475
Chloroethane	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4485

Drinking Water Parameters

Analyte	Method	Primary AB	Method Revision # or date	Technology Description	TNI Method Code	TNI Analyte Code
cis-1,2-Dichloroethylene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4645
cis-1,3-Dichloropropene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4680
Dibromomethane	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4595
Dichlorodifluoromethane	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4625
Dichloromethane	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4975
Ethylbenzene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4765
Hexachlorobutadiene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4835
Isopropylbenzene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4900
Methyl Bromide (Bromomethane)	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4950
Methyl Chloride (Chloromethane)	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4960
Methyl tert-butyl Ether (MTBE)	EPA 524.2	LA	rev 4.1	GC-MS	10088809	5000
Naphthalene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	5005
n-Butylbenzene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4435
n-Propylbenzene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	5090
sec-Butylbenzene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4440
Styrene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	5100
tert-Butylbenzene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4445
Tetrachloroethylene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	5115
Toluene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	5140
Total Haloacetic Acids (HAA5)	EPA 552.2	TX	rev 1.0	GC-ECD	10095804	9414
Total Trihalomethanes (THMs)	EPA 524.2	TX	rev 4.1	GC-MS	10088809	5205

Drinking Water Parameters

Analyte	Method	Primary AB	Method Revision # or date	Technology Description	TNI Method Code	TNI Analyte Code
trans-1,2-Dichloroethylene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	4700
trans-1,3-Dichloropropene	EPA 524.2	LA	rev 4.1	GC-MS	10088809	4685
Trichloroethylene	EPA 524.2	TX	rev 4.1	GC-MS	10088809	5170
Trichlorofluoromethane	EPA 524.2	LA	rev 4.1	GC-MS	10088809	5175
Vinyl Chloride	EPA 524.2	TX	rev 4.1	GC-MS	10088809	5235
Xylenes (total)	EPA 524.2	TX	rev 4.1	GC-MS	10088809	5260

The State of Texas is the primary TNI Accreditation Body for most analytes for the City of Fort Worth Water Department. The Louisiana Department of Health is a secondary Accreditation Body for this laboratory. For a list of additional parameters, refer to the Texas Commission on Environmental Quality.

Texas Commission on Environmental Quality

NELAP-Recognized Laboratory Accreditation is hereby awarded to

Xenco Laboratory - Houston

4147 Greenbriar Drive
Stafford, TX 77477-3907

in accordance with Texas Water Code Chapter 5, Subchapter R, Title 30 Texas Administrative Code Chapter 25, and the National Environmental Laboratory Accreditation Program.

The laboratory's scope of accreditation includes the fields of accreditation that accompany this certificate. Continued accreditation depends upon successful ongoing participation in the program. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current location(s) and accreditation status for particular methods and analyses (www.tceq.texas.gov/goto/lab). Accreditation does not imply that a product, process, system or person is approved by the Texas Commission on Environmental Quality.

Certificate Number: **T104704215-19-30**
Effective Date: **7/1/2019**
Expiration Date: **6/30/2020**

Executive Director Texas Commission on Environmental Quality

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704215-19-30
Expiration Date: 6/30/2020
Issue Date: 7/1/2019

Xenco Laboratory - Houston

4147 Greenbriar Drive
Stafford, TX 77477-3907

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Drinking Water***

Method EPA 200.7

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10013806
Antimony	TX	1005	10013806
Arsenic	TX	1010	10013806
Barium	TX	1015	10013806
Beryllium	TX	1020	10013806
Boron	TX	1025	10013806
Cadmium	TX	1030	10013806
Chromium	TX	1040	10013806
Cobalt	TX	1050	10013806
Copper	TX	1055	10013806
Iron	TX	1070	10013806
Lead	TX	1075	10013806
Lithium	TX	1080	10013806
Magnesium	TX	1085	10013806
Manganese	TX	1090	10013806
Molybdenum	TX	1100	10013806
Nickel	TX	1105	10013806
Potassium	TX	1125	10013806
Selenium	TX	1140	10013806
Silica as SiO2	TX	1990	10013806
Silver	TX	1150	10013806
Sodium	TX	1155	10013806
Strontium	TX	1160	10013806
Tin	TX	1175	10013806
Titanium	TX	1180	10013806
Vanadium	TX	1185	10013806
Zinc	TX	1190	10013806

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID

Certificate: T104704215-19-30
Expiration Date: 6/30/2020
Issue Date: 7/1/2019

Xenco Laboratory - Houston

4147 Greenbriar Drive
Stafford, TX 77477-3907

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Drinking Water***

Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Cadmium	TX	1030	10014605
Chromium	TX	1040	10014605
Copper	TX	1055	10014605
Lead	TX	1075	10014605
Manganese	TX	1090	10014605
Nickel	TX	1105	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Thallium	TX	1165	10014605
Uranium	TX	3035	10014605
Zinc	TX	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Chlorite	TX	1595	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrite as N	TX	1840	10053200
Sulfate	TX	2000	10053200

Method EPA 300.0 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chlorate	TX	1570	10275408

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Certificate: T104704215-19-30
Expiration Date: 6/30/2020
Issue Date: 7/1/2019

Xenco Laboratory - Houston

4147 Greenbriar Drive
Stafford, TX 77477-3907

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Drinking Water***

Method EPA 335.4

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	10061402

Method EPA 353.2

Analyte	AB	Analyte ID	Method ID
Nitrate as N	TX	1810	10067604
Nitrite as N	TX	1840	10067604

Method SM 2510 B

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	20048004

Method SM 2540 C

Analyte	AB	Analyte ID	Method ID
Residue-filterable (TDS)	TX	1955	20049803

Texas Commission on Environmental Quality

NELAP - Recognized Laboratory Fields of Accreditation

Xenco Laboratory - Houston

4147 Greenbriar Drive
Stafford, TX 77477-3907

Certificate:	**T104704215-19-30**
Expiration Date:	**6/30/2020**
Issue Date:	**7/1/2019**

These fields of accreditation supercede all previous fields. The Texas Commission on Environmental Quality urges customers to verify the laboratory's current accreditation status for particular methods and analyses.

Matrix: ***Non-Potable Water***

Method EPA 1010

Analyte	**AB**	**Analyte ID**	**Method ID**
Ignitability	TX	1780	10116606

Method EPA 1311

Analyte	**AB**	**Analyte ID**	**Method ID**
TCLP	TX	849	10118806

Method EPA 1312

Analyte	**AB**	**Analyte ID**	**Method ID**
SPLP	TX	850	10119003

Method EPA 160.4

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-volatile	TX	1970	10010409

Method EPA 1664

Analyte	**AB**	**Analyte ID**	**Method ID**
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10127807
Silica Gel Treated n-Hexane Extractable Material (SGT-HEM)	TX	10220	10127807

Method EPA 180.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	TX	2055	10011606

Method EPA 200.7

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10013806
Antimony	TX	1005	10013806
Arsenic	TX	1010	10013806
Barium	TX	1015	10013806
Beryllium	TX	1020	10013806
Boron	TX	1025	10013806
Cadmium	TX	1030	10013806
Calcium	TX	1035	10013806
Chromium	TX	1040	10013806
Cobalt	TX	1050	10013806

Matrix: ***Non-Potable Water***

Copper	TX	1055	10013806
Iron	TX	1070	10013806
Lead	TX	1075	10013806
Lithium	TX	1080	10013806
Magnesium	TX	1085	10013806
Manganese	TX	1090	10013806
Molybdenum	TX	1100	10013806
Nickel	TX	1105	10013806
Potassium	TX	1125	10013806
Selenium	TX	1140	10013806
Silica as SiO2	TX	1990	10013806
Silver	TX	1150	10013806
Sodium	TX	1155	10013806
Strontium	TX	1160	10013806
Thallium	TX	1165	10013806
Tin	TX	1175	10013806
Titanium	TX	1180	10013806
Vanadium	TX	1185	10013806
Zinc	TX	1190	10013806

Method EPA 200.8

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10014605
Antimony	TX	1005	10014605
Arsenic	TX	1010	10014605
Barium	TX	1015	10014605
Beryllium	TX	1020	10014605
Boron	TX	1025	10014605
Cadmium	TX	1030	10014605
Chromium	TX	1040	10014605
Cobalt	TX	1050	10014605

Matrix: *Non-Potable Water*

Copper	TX	1055	10014605
Iron	TX	1070	10014605
Lead	TX	1075	10014605
Magnesium	TX	1085	10014605
Manganese	TX	1090	10014605
Molybdenum	TX	1100	10014605
Nickel	TX	1105	10014605
Potassium	TX	1125	10014605
Selenium	TX	1140	10014605
Silver	TX	1150	10014605
Sodium	TX	1155	10014605
Strontium	TX	1160	10014605
Thallium	TX	1165	10014605
Tin	TX	1175	10014605
Titanium	TX	1180	10014605
Uranium	TX	3035	10014605
Vanadium	TX	1185	10014605
Zinc	TX	1190	10014605

Method EPA 245.1

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10036609

Method EPA 300.0

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Matrix: ***Non-Potable Water***

Method EPA 335.4

Analyte	AB	Analyte ID	Method ID
Total cyanide	TX	1645	10061402

Method EPA 350.1

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10063408

Method EPA 351.2

Analyte	AB	Analyte ID	Method ID
Kjeldahl Nitrogen (Total Kjeldahl Nitrogen-TKN)	TX	1790	10065404

Method EPA 353.2

Analyte	AB	Analyte ID	Method ID
Nitrate as N	TX	1810	10067400
Nitrate-nitrite	TX	1820	10067400
Nitrite as N	TX	1840	10067400

Method EPA 360.1

Analyte	AB	Analyte ID	Method ID
Oxygen, dissolved	TX	1880	10069008

Method EPA 365.1

Analyte	AB	Analyte ID	Method ID
Orthophosphate as P	TX	1870	10070005
Phosphorus	TX	1910	10070005

Method EPA 420.4

Analyte	AB	Analyte ID	Method ID
Total phenolics	TX	1905	10080203

Method EPA 524.2

Analyte	AB	Analyte ID	Method ID
1,2-Dichlorobenzene	TX	4610	10088809
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10088809
4-Methyl-2-pentanone (MIBK)	TX	4995	10088809
Benzene	TX	4375	10088809
Chlorobenzene	TX	4475	10088809

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Matrix: ***Non-Potable Water***

Chloroform	TX	4505	10088809
Methyl tert-butyl ether (MTBE)	TX	5000	10088809
Methylene chloride (Dichloromethane)	TX	4975	10088809
Tetrahydrofuran (THF)	TX	5120	10088809
Toluene	TX	5140	10088809

Method EPA 6010

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10155609
Antimony	TX	1005	10155609
Arsenic	TX	1010	10155609
Barium	TX	1015	10155609
Beryllium	TX	1020	10155609
Boron	TX	1025	10155609
Cadmium	TX	1030	10155609
Calcium	TX	1035	10155609
Chromium	TX	1040	10155609
Cobalt	TX	1050	10155609
Copper	TX	1055	10155609
Iron	TX	1070	10155609
Lead	TX	1075	10155609
Lithium	TX	1080	10155609
Magnesium	TX	1085	10155609
Manganese	TX	1090	10155609
Molybdenum	TX	1100	10155609
Nickel	TX	1105	10155609
Phosphorus	TX	1910	10155609
Potassium	TX	1125	10155609
Selenium	TX	1140	10155609
Silica as SiO2	TX	1990	10155609
Silver	TX	1150	10155609

Matrix: ***Non-Potable Water***

Sodium	TX	1155	10155609
Strontium	TX	1160	10155609
Thallium	TX	1165	10155609
Tin	TX	1175	10155609
Titanium	TX	1180	10155609
Vanadium	TX	1185	10155609
Zinc	TX	1190	10155609

Method EPA 6020

Analyte	AB	Analyte ID	Method ID
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Boron	TX	1025	10156419
Cadmium	TX	1030	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419
Strontium	TX	1160	10156419

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Matrix: ***Non-Potable Water***

Thallium	TX	1165	10156419
Tin	TX	1175	10156419
Titanium	TX	1180	10156419
Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 608

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10103603
4,4'-DDE	TX	7360	10103603
4,4'-DDT	TX	7365	10103603
Aldrin	TX	7025	10103603
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10103603
alpha-Chlordane	TX	7240	10103603
Aroclor-1016 (PCB-1016)	TX	8880	10103603
Aroclor-1221 (PCB-1221)	TX	8885	10103603
Aroclor-1232 (PCB-1232)	TX	8890	10103603
Aroclor-1242 (PCB-1242)	TX	8895	10103603
Aroclor-1248 (PCB-1248)	TX	8900	10103603
Aroclor-1254 (PCB-1254)	TX	8905	10103603
Aroclor-1260 (PCB-1260)	TX	8910	10103603
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10103603
Chlordane (tech.)	TX	7250	10103603
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10103603
Dieldrin	TX	7470	10103603
Endosulfan I	TX	7510	10103603
Endosulfan II	TX	7515	10103603
Endosulfan sulfate	TX	7520	10103603
Endrin	TX	7540	10103603
Endrin aldehyde	TX	7530	10103603
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10103603

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Matrix: ***Non-Potable Water***

gamma-Chlordane	TX	7245	10103603
Heptachlor	TX	7685	10103603
Heptachlor epoxide	TX	7690	10103603
Methoxychlor	TX	7810	10103603
Toxaphene (Chlorinated camphene)	TX	8250	10103603

Method EPA 615

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	TX	8655	10298201
2,4-D	TX	8545	10298201
2,4-DB	TX	8560	10298201
Dalapon	TX	8555	10298201
Dicamba	TX	8595	10298201
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10298201
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10298201
MCPA	TX	7775	10298201
MCPP	TX	7780	10298201
Silvex (2,4,5-TP)	TX	8650	10298201

Method EPA 624

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1-Trichloroethane	TX	5160	10107207
1,1,2,2-Tetrachloroethane	TX	5110	10107207
1,1,2-Trichloroethane	TX	5165	10107207
1,1-Dichloroethane	TX	4630	10107207
1,1-Dichloroethylene	TX	4640	10107207
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10107207
1,2-Dichlorobenzene	TX	4610	10107207
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10107207
1,2-Dichloropropane	TX	4655	10107207
1,3-Dichlorobenzene	TX	4615	10107207
1,4-Dichlorobenzene	TX	4620	10107207
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10107207

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Matrix: ***Non-Potable Water***

2-Chloroethyl vinyl ether	TX	4500	10107207
Acetone (2-Propanone)	TX	4315	10107207
Acrolein (Propenal)	TX	4325	10107207
Acrylonitrile	TX	4340	10107207
Benzene	TX	4375	10107207
Bromodichloromethane	TX	4395	10107207
Bromoform	TX	4400	10107207
Carbon tetrachloride	TX	4455	10107207
Chlorobenzene	TX	4475	10107207
Chlorodibromomethane	TX	4575	10107207
Chloroethane (Ethyl chloride)	TX	4485	10107207
Chloroform	TX	4505	10107207
cis-1,2-Dichloroethylene	TX	4645	10107207
cis-1,3-Dichloropropene	TX	4680	10107207
Ethylbenzene	TX	4765	10107207
m+p-xylene	TX	5240	10107207
Methyl bromide (Bromomethane)	TX	4950	10107207
Methyl chloride (Chloromethane)	TX	4960	10107207
Methyl tert-butyl ether (MTBE)	TX	5000	10107207
Methylene chloride (Dichloromethane)	TX	4975	10107207
o-Xylene	TX	5250	10107207
Tetrachloroethylene (Perchloroethylene)	TX	5115	10107207
Toluene	TX	5140	10107207
trans-1,2-Dichloroethylene	TX	4700	10107207
trans-1,3-Dichloropropylene	TX	4685	10107207
Trichloroethene (Trichloroethylene)	TX	5170	10107207
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10107207
Vinyl chloride	TX	5235	10107207
Xylene (total)	TX	5260	10107207

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Matrix: ***Non-Potable Water***

Method EPA 625

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10107401
1,2,4-Trichlorobenzene	TX	5155	10107401
1,2-Dichlorobenzene	TX	4610	10107401
1,2-Diphenylhydrazine	TX	6220	10107401
1,3-Dichlorobenzene	TX	4615	10107401
1,4-Dichlorobenzene	TX	4620	10107401
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10107401
2,3,4,6-Tetrachlorophenol	TX	6735	10107401
2,4,5-Trichlorophenol	TX	6835	10107401
2,4,6-Trichlorophenol	TX	6840	10107401
2,4-Dichlorophenol	TX	6000	10107401
2,4-Dimethylphenol	TX	6130	10107401
2,4-Dinitrophenol	TX	6175	10107401
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10107401
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10107401
2-Chloronaphthalene	TX	5795	10107401
2-Chlorophenol	TX	5800	10107401
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10107401
2-Methylphenol (o-Cresol)	TX	6400	10107401
2-Nitrophenol	TX	6490	10107401
3,3'-Dichlorobenzidine	TX	5945	10107401
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10107401
4-Chloro-3-methylphenol	TX	5700	10107401
4-Chlorophenyl phenylether	TX	5825	10107401
4-Methylphenol (p-Cresol)	TX	6410	10107401
4-Nitrophenol	TX	6500	10107401
Acenaphthene	TX	5500	10107401
Acenaphthylene	TX	5505	10107401

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Matrix: ***Non-Potable Water***

Anthracene	TX	5555	10107401
Benzidine	TX	5595	10107401
Benzo(a)anthracene	TX	5575	10107401
Benzo(a)pyrene	TX	5580	10107401
Benzo(b)fluoranthene	TX	5585	10107401
Benzo(g,h,i)perylene	TX	5590	10107401
Benzo(k)fluoranthene	TX	5600	10107401
bis(2-Chloroethoxy)methane	TX	5760	10107401
bis(2-Chloroethyl) ether	TX	5765	10107401
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10107401
Butyl benzyl phthalate	TX	5670	10107401
Chrysene	TX	5855	10107401
Dibenz(a,h) anthracene	TX	5895	10107401
Diethyl phthalate	TX	6070	10107401
Dimethyl phthalate	TX	6135	10107401
Di-n-butyl phthalate	TX	5925	10107401
Di-n-octyl phthalate	TX	6200	10107401
Fluoranthene	TX	6265	10107401
Fluorene	TX	6270	10107401
Hexachlorobenzene	TX	6275	10107401
Hexachlorobutadiene	TX	4835	10107401
Hexachlorocyclopentadiene	TX	6285	10107401
Hexachloroethane	TX	4840	10107401
Indeno(1,2,3-cd) pyrene	TX	6315	10107401
Isophorone	TX	6320	10107401
Naphthalene	TX	5005	10107401
Nitrobenzene	TX	5015	10107401
n-Nitrosodiethylamine	TX	6525	10107401
n-Nitrosodimethylamine	TX	6530	10107401
n-Nitrosodi-n-butylamine	TX	5025	10107401

Matrix: ***Non-Potable Water***

n-Nitrosodi-n-propylamine	TX	6545	10107401
n-Nitrosodiphenylamine	TX	6535	10107401
Pentachlorobenzene	TX	6590	10107401
Pentachlorophenol	TX	6605	10107401
Phenanthrene	TX	6615	10107401
Phenol	TX	6625	10107401
Pyrene	TX	6665	10107401
Pyridine	TX	5095	10107401

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165603

Method EPA 8011

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,3-Trichloropropane	TX	5180	10173009
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10173009

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	TX	9369	10173203
Gasoline range organics (GRO)	TX	9408	10173203

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178800
4,4'-DDE	TX	7360	10178800
4,4'-DDT	TX	7365	10178800
Alachlor	TX	7005	10178800
Aldrin	TX	7025	10178800
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178800

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Matrix: ***Non-Potable Water***

alpha-Chlordane	TX	7240	10178800
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178800
Chlordane (tech.)	TX	7250	10178800
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178800
Dicofol (Kelthane)	TX	7460	10178800
Dieldrin	TX	7470	10178800
Endosulfan I	TX	7510	10178800
Endosulfan II	TX	7515	10178800
Endosulfan sulfate	TX	7520	10178800
Endrin	TX	7540	10178800
Endrin aldehyde	TX	7530	10178800
Endrin ketone	TX	7535	10178800
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178800
gamma-Chlordane	TX	7245	10178800
Heptachlor	TX	7685	10178800
Heptachlor epoxide	TX	7690	10178800
Methoxychlor	TX	7810	10178800
Mirex	TX	7870	10178800
Toxaphene (Chlorinated camphene)	TX	8250	10178800

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)	TX	9025	10179201
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)	TX	9080	10179201
2,2',3',4,5-Pentachlorobiphenyl (BZ-97)	TX	9154	10179201
2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)	TX	9035	10179201
2,2',3,5'-Tetrachlorobiphenyl (BZ-44)	TX	8945	10179201
2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)	TX	8980	10179201
2,2',5,5'-Tetrachlorobiphenyl (BZ-52)	TX	8955	10179201
2,2',5-Trichlorobiphenyl (BZ-18)	TX	8930	10179201
2,3,3',4,5,5'-Hexachlorobiphenyl (BZ-159)	TX	9196	10179201

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Matrix: ***Non-Potable Water***

2,3,3',4',6-Pentachlorobiphenyl (BZ-110)	TX	8990	10179201
2,3',4,4'-Tetrachlorobiphenyl (BZ-66)	TX	8960	10179201
2,3-Dichlorobiphenyl (BZ-5)	TX	8920	10179201
2,4',5-Trichlorobiphenyl (BZ-31)	TX	8940	10179201
2-Chlorobiphenyl (BZ-1)	TX	8915	10179201
Aroclor-1016 (PCB-1016)	TX	8880	10179201
Aroclor-1221 (PCB-1221)	TX	8885	10179201
Aroclor-1232 (PCB-1232)	TX	8890	10179201
Aroclor-1242 (PCB-1242)	TX	8895	10179201
Aroclor-1248 (PCB-1248)	TX	8900	10179201
Aroclor-1254 (PCB-1254)	TX	8905	10179201
Aroclor-1260 (PCB-1260)	TX	8910	10179201
PCBs (total)	TX	8870	10179201

Method EPA 8151

Analyte	**AB**	**Analyte ID**	**Method ID**
2,4,5-T	TX	8655	10183003
2,4-D	TX	8545	10183003
2,4-DB	TX	8560	10183003
Dalapon	TX	8555	10183003
Dicamba	TX	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183003
MCPA	TX	7775	10183003
MCPP	TX	7780	10183003
Pentachlorophenol	TX	6605	10183003
Picloram	TX	8645	10183003
Silvex (2,4,5-TP)	TX	8650	10183003

Method EPA 8260

Analyte	**AB**	**Analyte ID**	**Method ID**
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404

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Matrix: ***Non-Potable Water***

1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184404
1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404

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Matrix: ***Non-Potable Water***

Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404
Acrylonitrile	TX	4340	10184404
Benzene	TX	4375	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromofluoromethane	TX	4590	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Di-isopropylether (DIPE)	TX	9375	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Ethyl-t-butylether (ETBE) (2-Ethoxy-2-methylpropane)	TX	4770	10184404
Hexachlorobutadiene	TX	4835	10184404
Iodomethane (Methyl iodide)	TX	4870	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methyl acetate	TX	4940	10184802
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404

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Matrix: ***Non-Potable Water***

Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184608
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404
o-Xylene	TX	5250	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
T-amylmethylether (TAME)	TX	4370	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

Method EPA 8270

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,4,5-Tetrachlorobenzene	TX	6715	10185601
1,2,4-Trichlorobenzene	TX	5155	10185805
1,2-Dichlorobenzene	TX	4610	10185805
1,2-Diphenylhydrazine	TX	6220	10185805
1,3-Dichlorobenzene	TX	4615	10185805
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185805

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Matrix: ***Non-Potable Water***

1,4-Dichlorobenzene	TX	4620	10185805
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185805
2,3,4,6-Tetrachlorophenol	TX	6735	10185805
2,4,5-Trichlorophenol	TX	6835	10185805
2,4,6-Trichlorophenol	TX	6840	10185805
2,4-Dichlorophenol	TX	6000	10185805
2,4-Dimethylphenol	TX	6130	10185805
2,4-Dinitrophenol	TX	6175	10185805
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185805
2,6-Dichlorophenol	TX	6005	10185805
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185805
2-Chloronaphthalene	TX	5795	10185805
2-Chlorophenol	TX	5800	10185805
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185805
2-Methylnaphthalene	TX	6385	10185805
2-Methylphenol (o-Cresol)	TX	6400	10185805
2-Nitroaniline	TX	6460	10185805
2-Nitrophenol	TX	6490	10185805
2-Picoline (2-Methylpyridine)	TX	5050	10185805
3,3'-Dichlorobenzidine	TX	5945	10185805
3-Methylphenol (m-Cresol)	TX	6405	10185805
3-Nitroaniline	TX	6465	10185805
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185805
4-Chloro-3-methylphenol	TX	5700	10185805
4-Chloroaniline	TX	5745	10185805
4-Chlorophenyl phenylether	TX	5825	10185805
4-Methylphenol (p-Cresol)	TX	6410	10185805
4-Nitroaniline	TX	6470	10185805
4-Nitrophenol	TX	6500	10185805
Acenaphthene	TX	5500	10185805

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Matrix: ***Non-Potable Water***

Acenaphthylene	TX	5505	10185805
Acetophenone	TX	5510	10185805
Aniline	TX	5545	10185805
Anthracene	TX	5555	10185805
Atrazine	TX	7065	10186002
Benzidine	TX	5595	10185805
Benzo(a)anthracene	TX	5575	10185805
Benzo(a)pyrene	TX	5580	10185805
Benzo(b)fluoranthene	TX	5585	10185805
Benzo(g,h,i)perylene	TX	5590	10185805
Benzo(k)fluoranthene	TX	5600	10185805
Benzoic acid	TX	5610	10185805
Benzyl alcohol	TX	5630	10185805
Biphenyl	TX	5640	10185601
bis(2-Chloroethoxy)methane	TX	5760	10185805
bis(2-Chloroethyl) ether	TX	5765	10185805
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185805
Butyl benzyl phthalate	TX	5670	10185805
Caprolactam	TX	7180	10185805
Carbaryl (Sevin)	TX	7195	10185805
Carbazole	TX	5680	10185805
Chrysene	TX	5855	10185805
Dibenz(a,h) anthracene	TX	5895	10185805
Dibenzofuran	TX	5905	10185805
Diethyl phthalate	TX	6070	10185805
Dimethyl phthalate	TX	6135	10185805
Di-n-butyl phthalate	TX	5925	10185805
Di-n-octyl phthalate	TX	6200	10185805
Diphenylamine	TX	6205	10185805
Ethyl methanesulfonate	TX	6260	10185805

Matrix: ***Non-Potable Water***

Fluoranthene	TX	6265	10185805
Fluorene	TX	6270	10185805
Hexachlorobenzene	TX	6275	10185805
Hexachlorobutadiene	TX	4835	10185805
Hexachlorocyclopentadiene	TX	6285	10185805
Hexachloroethane	TX	4840	10185805
Hexachlorophene	TX	6290	10185805
Hexachloropropene	TX	6295	10185805
Indeno(1,2,3-cd) pyrene	TX	6315	10185805
Isophorone	TX	6320	10185805
Methyl methanesulfonate	TX	6375	10185805
Naphthalene	TX	5005	10185805
Nitrobenzene	TX	5015	10185805
n-Nitrosodiethylamine	TX	6525	10185805
n-Nitrosodimethylamine	TX	6530	10185805
n-Nitrosodi-n-butylamine	TX	5025	10185805
n-Nitrosodi-n-propylamine	TX	6545	10185805
n-Nitrosodiphenylamine	TX	6535	10185805
n-Nitrosomethylethylamine	TX	6550	10185805
n-Nitrosomorpholine	TX	6555	10185805
n-Nitrosopiperidine	TX	6560	10185805
n-Nitrosopyrrolidine	TX	6565	10185805
Pentachlorobenzene	TX	6590	10185805
Pentachlorophenol	TX	6605	10185805
Phenanthrene	TX	6615	10185805
Phenol	TX	6625	10185805
Pyrene	TX	6665	10185805
Pyridine	TX	5095	10185805

Method EPA 9012

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

Amenable cyanide	TX	1510	10193405
Total cyanide	TX	1645	10193405

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	10196802

Method EPA 9050

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	10198604

Method EPA 9056

Analyte	**AB**	**Analyte ID**	**Method ID**
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Sulfate	TX	2000	10199209

Method EPA 9060

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	10200201

Method EPA 9066

Analyte	**AB**	**Analyte ID**	**Method ID**
Total phenolics	TX	1905	10200609

Method HACH 8000

Analyte	**AB**	**Analyte ID**	**Method ID**
Chemical oxygen demand (COD)	TX	1565	60003001

Method Iowa OA-2; DRO

Analyte	**AB**	**Analyte ID**	**Method ID**
Extractable Petroleum Hydrocarbons (EPH)	TX	10331	90016607

Method SM 2120 B

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Non-Potable Water***

Color	TX	1605	20223807

Method SM 2120 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Color	TX	1605	20002000

Method SM 2130 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Turbidity	TX	2055	20042200

Method SM 2310 B (4a)

Analyte	**AB**	**Analyte ID**	**Method ID**
Acidity, as CaCO3	TX	1500	20002806

Method SM 2320 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2340 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Total hardness as CaCO3	TX	1755	20046008

Method SM 2510 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Conductivity	TX	1610	20048004

Method SM 2540 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-total (total solids)	TX	1950	20004608

Method SM 2540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-filterable (TDS)	TX	1955	20049803

Method SM 2540 D

Analyte	**AB**	**Analyte ID**	**Method ID**
Residue-nonfilterable (TSS)	TX	1960	20004802

Method SM 3500-Cr B

Analyte	**AB**	**Analyte ID**	**Method ID**
Chromium (VI)	TX	1045	20065809

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Matrix: ***Non-Potable Water***

Method SM 4500-Cl G

Analyte	**AB**	**Analyte ID**	**Method ID**
Total residual chlorine	TX	1940	20020604

Method SM 4500-CN$^-$ G

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	20021607

Method SM 4500-H+ B

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	20104603

Method SM 4500-S2$^-$ F

Analyte	**AB**	**Analyte ID**	**Method ID**
Sulfide	TX	2005	20126209

Method SM 5210 B

Analyte	**AB**	**Analyte ID**	**Method ID**
Biochemical oxygen demand (BOD)	TX	1530	20027401
Carbonaceous BOD, CBOD	TX	1555	20027401

Method SM 5310 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Organic Carbon (TOC)	TX	2040	20138209

Method SM 5540 C

Analyte	**AB**	**Analyte ID**	**Method ID**
Surfactants - MBAS	TX	2025	20144405

Method TCEQ 1005

Analyte	**AB**	**Analyte ID**	**Method ID**
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

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Matrix: ***Solid & Chemical Materials***

Method ASTM D2216

Analyte	AB	Analyte ID	Method ID
Moisture	TX	10337	ASTM D2216-05

Method EPA 1010

Analyte	AB	Analyte ID	Method ID
Ignitability	TX	1780	10116606

Method EPA 1311

Analyte	AB	Analyte ID	Method ID
TCLP	TX	849	10118806

Method EPA 1312

Analyte	AB	Analyte ID	Method ID
SPLP	TX	850	10119003

Method EPA 300.0

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10053200
Chloride	TX	1575	10053200
Fluoride	TX	1730	10053200
Nitrate as N	TX	1810	10053200
Nitrate-nitrite	TX	1820	10053200
Nitrite as N	TX	1840	10053200
Orthophosphate as P	TX	1870	10053200
Sulfate	TX	2000	10053200

Method EPA 350.1

Analyte	AB	Analyte ID	Method ID
Ammonia as N	TX	1515	10063408

Method EPA 353.2

Analyte	AB	Analyte ID	Method ID
Nitrate-nitrite	TX	1820	10067604
Nitrite as N	TX	1840	10067604

Method EPA 6010

Analyte	AB	Analyte ID	Method ID

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Matrix: ***Solid & Chemical Materials***

Aluminum	TX	1000	10155609
Antimony	TX	1005	10155609
Arsenic	TX	1010	10155609
Barium	TX	1015	10155609
Beryllium	TX	1020	10155609
Boron	TX	1025	10155609
Cadmium	TX	1030	10155609
Calcium	TX	1035	10155609
Chromium	TX	1040	10155609
Cobalt	TX	1050	10155609
Copper	TX	1055	10155609
Iron	TX	1070	10155609
Lead	TX	1075	10155609
Lithium	TX	1080	10155609
Magnesium	TX	1085	10155609
Manganese	TX	1090	10155609
Molybdenum	TX	1100	10155609
Nickel	TX	1105	10155609
Phosphorus	TX	1910	10155609
Potassium	TX	1125	10155609
Selenium	TX	1140	10155609
Silica as SiO2	TX	1990	10155609
Silver	TX	1150	10155609
Sodium	TX	1155	10155609
Strontium	TX	1160	10155609
Thallium	TX	1165	10155609
Tin	TX	1175	10155609
Titanium	TX	1180	10155609
Vanadium	TX	1185	10155609
Zinc	TX	1190	10155609

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Matrix: ***Solid & Chemical Materials***

Method EPA 6020

Analyte	**AB**	**Analyte ID**	**Method ID**
Aluminum	TX	1000	10156419
Antimony	TX	1005	10156419
Arsenic	TX	1010	10156419
Barium	TX	1015	10156419
Beryllium	TX	1020	10156419
Boron	TX	1025	10156419
Cadmium	TX	1030	10156419
Calcium	TX	1035	10156419
Chromium	TX	1040	10156419
Cobalt	TX	1050	10156419
Copper	TX	1055	10156419
Iron	TX	1070	10156419
Lead	TX	1075	10156419
Magnesium	TX	1085	10156419
Manganese	TX	1090	10156419
Molybdenum	TX	1100	10156419
Nickel	TX	1105	10156419
Potassium	TX	1125	10156419
Selenium	TX	1140	10156419
Silver	TX	1150	10156419
Sodium	TX	1155	10156419
Strontium	TX	1160	10156419
Thallium	TX	1165	10156419
Tin	TX	1175	10156419
Titanium	TX	1180	10156419
Vanadium	TX	1185	10156419
Zinc	TX	1190	10156419

Method EPA 7196

Analyte	**AB**	**Analyte ID**	**Method ID**

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Matrix: ***Solid & Chemical Materials***

Chromium (VI)	TX	1045	10162206

Method EPA 7470

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10165807

Method EPA 7471

Analyte	**AB**	**Analyte ID**	**Method ID**
Mercury	TX	1095	10166457

Method EPA 8011

Analyte	**AB**	**Analyte ID**	**Method ID**
1,2,3-Trichloropropane	TX	5180	10173009
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10173009
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10173009

Method EPA 8015

Analyte	**AB**	**Analyte ID**	**Method ID**
Diesel range organics (DRO)	TX	9369	10173203
Gasoline range organics (GRO)	TX	9408	10173203

Method EPA 8081

Analyte	**AB**	**Analyte ID**	**Method ID**
4,4'-DDD	TX	7355	10178800
4,4'-DDE	TX	7360	10178800
4,4'-DDT	TX	7365	10178800
Alachlor	TX	7005	10178800
Aldrin	TX	7025	10178800
alpha-BHC (alpha-Hexachlorocyclohexane)	TX	7110	10178800
alpha-Chlordane	TX	7240	10178800
beta-BHC (beta-Hexachlorocyclohexane)	TX	7115	10178800
Chlordane (tech.)	TX	7250	10178800
DDD,Total	TX	10314	10178800
DDE,Total	TX	10315	10178800
DDT,Total	TX	10316	10178800
delta-BHC (delta-Hexachlorocyclohexane)	TX	7105	10178800

Matrix: ***Solid & Chemical Materials***

Dieldrin	TX	7470	10178800
Endosulfan I	TX	7510	10178800
Endosulfan II	TX	7515	10178800
Endosulfan sulfate	TX	7520	10178800
Endrin	TX	7540	10178800
Endrin aldehyde	TX	7530	10178800
Endrin ketone	TX	7535	10178800
gamma-BHC (Lindane, gamma-Hexachlorocyclohexane)	TX	7120	10178800
gamma-Chlordane	TX	7245	10178800
Heptachlor	TX	7685	10178800
Heptachlor epoxide	TX	7690	10178800
Methoxychlor	TX	7810	10178800
Toxaphene (Chlorinated camphene)	TX	8250	10178800

Method EPA 8082

Analyte	**AB**	**Analyte ID**	**Method ID**
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ-206)	TX	9095	10179007
2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ-170)	TX	9065	10179007
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ-180)	TX	9134	10179007
2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ-183)	TX	9075	10179007
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ-138)	TX	9025	10179007
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ-187)	TX	9080	10179007
2,2',3,4,5,5'-Hexachlorobiphenyl (BZ-141)	TX	9030	10179007
2,2',3,4,5'-Pentachlorobiphenyl (BZ-87)	TX	8975	10179007
2,2',3,5,5',6-Hexachlorobiphenyl (BZ-151)	TX	9035	10179007
2,2',3,5'-Tetrachlorobiphenyl (BZ-44)	TX	8945	10179007
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ-153)	TX	9040	10179007
2,2',4,5,5'-Pentachlorobiphenyl (BZ-101)	TX	8980	10179007
2,2',5,5'-Tetrachlorobiphenyl (BZ-52)	TX	8955	10179007
2,2',5-Trichlorobiphenyl (BZ-18)	TX	8930	10179007
2,3,3',4',6-Pentachlorobiphenyl (BZ-110)	TX	8990	10179007

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Matrix: ***Solid & Chemical Materials***

2,3',4,4'-Tetrachlorobiphenyl (BZ-66)	TX	8960	10179007
2,3-Dichlorobiphenyl (BZ-5)	TX	8920	10179007
2,4',5-Trichlorobiphenyl (BZ-31)	TX	8940	10179007
2-Chlorobiphenyl (BZ-1)	TX	8915	10179007
Aroclor-1016 (PCB-1016)	TX	8880	10179007
Aroclor-1221 (PCB-1221)	TX	8885	10179007
Aroclor-1232 (PCB-1232)	TX	8890	10179007
Aroclor-1242 (PCB-1242)	TX	8895	10179007
Aroclor-1248 (PCB-1248)	TX	8900	10179007
Aroclor-1254 (PCB-1254)	TX	8905	10179007
Aroclor-1260 (PCB-1260)	TX	8910	10179007
PCBs (total)	TX	8870	10179007

Method EPA 8151

Analyte	AB	Analyte ID	Method ID
2,4,5-T	TX	8655	10183003
2,4-D	TX	8545	10183003
2,4-DB	TX	8560	10183003
Dalapon	TX	8555	10183003
Dicamba	TX	8595	10183003
Dichloroprop (Dichlorprop, Weedone)	TX	8605	10183003
Dinoseb (2-sec-butyl-4,6-dinitrophenol, DNBP)	TX	8620	10183003
MCPA	TX	7775	10183003
MCPP	TX	7780	10183003
Pentachlorophenol	TX	6605	10183003
Silvex (2,4,5-TP)	TX	8650	10183003

Method EPA 8260

Analyte	AB	Analyte ID	Method ID
1,1,1,2-Tetrachloroethane	TX	5105	10184404
1,1,1-Trichloroethane	TX	5160	10184404
1,1,2,2-Tetrachloroethane	TX	5110	10184404
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	TX	5195	10184802

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Matrix: ***Solid & Chemical Materials***

1,1,2-Trichloroethane	TX	5165	10184404
1,1-Dichloroethane	TX	4630	10184404
1,1-Dichloroethylene	TX	4640	10184404
1,1-Dichloropropene	TX	4670	10184404
1,2,3-Trichlorobenzene	TX	5150	10184404
1,2,3-Trichloropropane	TX	5180	10184404
1,2,4-Trichlorobenzene	TX	5155	10184404
1,2,4-Trimethylbenzene	TX	5210	10184404
1,2-Dibromo-3-chloropropane (DBCP)	TX	4570	10184404
1,2-Dibromoethane (EDB, Ethylene dibromide)	TX	4585	10184404
1,2-Dichlorobenzene	TX	4610	10184404
1,2-Dichloroethane (Ethylene dichloride)	TX	4635	10184404
1,2-Dichloropropane	TX	4655	10184404
1,3,5-Trimethylbenzene	TX	5215	10184404
1,3-Dichlorobenzene	TX	4615	10184404
1,3-Dichloropropane	TX	4660	10184404
1,4-Dichlorobenzene	TX	4620	10184404
1,4-Dioxane (1,4-Diethyleneoxide)	TX	4735	10184404
1-Chlorohexane	TX	4510	10184404
2,2-Dichloropropane	TX	4665	10184404
2-Butanone (Methyl ethyl ketone, MEK)	TX	4410	10184404
2-Chloroethyl vinyl ether	TX	4500	10184404
2-Chlorotoluene	TX	4535	10184404
2-Hexanone (MBK)	TX	4860	10184404
4-Chlorotoluene	TX	4540	10184404
4-Isopropyltoluene (p-Cymene)	TX	4915	10184404
4-Methyl-2-pentanone (MIBK)	TX	4995	10184404
Acetone (2-Propanone)	TX	4315	10184404
Acetonitrile	TX	4320	10184404
Acrolein (Propenal)	TX	4325	10184404

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Matrix: ***Solid & Chemical Materials***

Acrylonitrile	TX	4340	10184404
Benzene	TX	4375	10184404
Bromobenzene	TX	4385	10184404
Bromochloromethane	TX	4390	10184404
Bromodichloromethane	TX	4395	10184404
Bromoform	TX	4400	10184404
Carbon disulfide	TX	4450	10184404
Carbon tetrachloride	TX	4455	10184404
Chlorobenzene	TX	4475	10184404
Chlorodibromomethane	TX	4575	10184404
Chloroethane (Ethyl chloride)	TX	4485	10184404
Chloroform	TX	4505	10184404
cis-1,2-Dichloroethylene	TX	4645	10184404
cis-1,3-Dichloropropene	TX	4680	10184404
Dibromomethane (Methylene bromide)	TX	4595	10184404
Dichlorodifluoromethane (Freon-12)	TX	4625	10184404
Ethyl methacrylate	TX	4810	10184404
Ethylbenzene	TX	4765	10184404
Hexachlorobutadiene	TX	4835	10184404
Isopropylbenzene (Cumene)	TX	4900	10184404
m+p-xylene	TX	5240	10184404
Methyl acetate	TX	4940	10184608
Methyl bromide (Bromomethane)	TX	4950	10184404
Methyl chloride (Chloromethane)	TX	4960	10184404
Methyl tert-butyl ether (MTBE)	TX	5000	10184404
Methylcyclohexane	TX	4965	10184608
Methylene chloride (Dichloromethane)	TX	4975	10184404
Naphthalene	TX	5005	10184404
n-Butylbenzene	TX	4435	10184404
n-Propylbenzene	TX	5090	10184404

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Matrix: ***Solid & Chemical Materials***

o-Xylene	TX	5250	10184404
sec-Butylbenzene	TX	4440	10184404
Styrene	TX	5100	10184404
tert-Butyl alcohol	TX	4420	10184404
tert-Butylbenzene	TX	4445	10184404
Tetrachloroethylene (Perchloroethylene)	TX	5115	10184404
Toluene	TX	5140	10184404
trans-1,2-Dichloroethylene	TX	4700	10184404
trans-1,3-Dichloropropylene	TX	4685	10184404
trans-1,4-Dichloro-2-butene	TX	4605	10184404
Trichloroethene (Trichloroethylene)	TX	5170	10184404
Trichlorofluoromethane (Fluorotrichloromethane, Freon 11)	TX	5175	10184404
Vinyl acetate	TX	5225	10184404
Vinyl chloride	TX	5235	10184404
Xylene (total)	TX	5260	10184404

Method EPA 8270

Analyte	AB	Analyte ID	Method ID
1,2,4,5-Tetrachlorobenzene	TX	6715	10185407
1,2,4-Trichlorobenzene	TX	5155	10185805
1,2-Dichlorobenzene	TX	4610	10185805
1,2-Diphenylhydrazine	TX	6220	10185805
1,3-Dichlorobenzene	TX	4615	10185805
1,3-Dinitrobenzene (1,3-DNB)	TX	6160	10185805
1,4-Dichlorobenzene	TX	4620	10185805
2,2'-Oxybis(1-chloropropane) (bis(2-Chloro-1-methylethyl)ether)	TX	4659	10185805
2,3,4,6-Tetrachlorophenol	TX	6735	10185805
2,4,5-Trichlorophenol	TX	6835	10185805
2,4,6-Trichlorophenol	TX	6840	10185805
2,4-Dichlorophenol	TX	6000	10185805
2,4-Dimethylphenol	TX	6130	10185805

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Matrix: ***Solid & Chemical Materials***

2,4-Dinitrophenol	TX	6175	10185805
2,4-Dinitrotoluene (2,4-DNT)	TX	6185	10185805
2,6-Dichlorophenol	TX	6005	10185805
2,6-Dinitrotoluene (2,6-DNT)	TX	6190	10185805
2-Chloronaphthalene	TX	5795	10185805
2-Chlorophenol	TX	5800	10185805
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-2-methylphenol)	TX	6360	10185805
2-Methylnaphthalene	TX	6385	10185805
2-Methylphenol (o-Cresol)	TX	6400	10185805
2-Nitroaniline	TX	6460	10185805
2-Nitrophenol	TX	6490	10185805
2-Picoline (2-Methylpyridine)	TX	5050	10185805
3,3'-Dichlorobenzidine	TX	5945	10185805
3-Methylphenol (m-Cresol)	TX	6405	10185805
3-Nitroaniline	TX	6465	10185805
4-Bromophenyl phenyl ether (BDE-3)	TX	5660	10185805
4-Chloro-3-methylphenol	TX	5700	10185805
4-Chloroaniline	TX	5745	10185805
4-Chlorophenyl phenylether	TX	5825	10185805
4-Methylphenol (p-Cresol)	TX	6410	10185805
4-Nitroaniline	TX	6470	10185805
4-Nitrophenol	TX	6500	10185805
Acenaphthene	TX	5500	10185805
Acenaphthylene	TX	5505	10185805
Acetophenone	TX	5510	10185805
Aniline	TX	5545	10185805
Anthracene	TX	5555	10185805
Atrazine	TX	7065	10186002
Azobenzene	TX	5562	10185805
Benzidine	TX	5595	10185805

Matrix: ***Solid & Chemical Materials***

Benzo(a)anthracene	TX	5575	10185805
Benzo(a)pyrene	TX	5580	10185805
Benzo(b)fluoranthene	TX	5585	10185805
Benzo(g,h,i)perylene	TX	5590	10185805
Benzo(k)fluoranthene	TX	5600	10185805
Benzoic acid	TX	5610	10185805
Benzyl alcohol	TX	5630	10185805
Biphenyl	TX	5640	10185601
bis(2-Chloroethoxy)methane	TX	5760	10185805
bis(2-Chloroethyl) ether	TX	5765	10185805
bis(2-Ethylhexyl) phthalate (Di(2-Ethylhexyl) phthalate, DEHP)	TX	6065	10185805
Butyl benzyl phthalate	TX	5670	10185805
Caprolactam	TX	7180	10186002
Carbazole	TX	5680	10185805
Chrysene	TX	5855	10185805
Dibenz(a,h) anthracene	TX	5895	10185805
Dibenzofuran	TX	5905	10185805
Diethyl phthalate	TX	6070	10185601
Dimethyl phthalate	TX	6135	10185805
Di-n-butyl phthalate	TX	5925	10185805
Di-n-octyl phthalate	TX	6200	10185805
Diphenylamine	TX	6205	10185805
Ethyl methanesulfonate	TX	6260	10185805
Fluoranthene	TX	6265	10185805
Fluorene	TX	6270	10185805
Hexachlorobenzene	TX	6275	10185805
Hexachlorobutadiene	TX	4835	10185805
Hexachlorocyclopentadiene	TX	6285	10185805
Hexachloroethane	TX	4840	10185805
Hexachloropropene	TX	6295	10185805

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Matrix: ***Solid & Chemical Materials***

Indeno(1,2,3-cd) pyrene	TX	6315	10185805
Isophorone	TX	6320	10185805
Methapyrilene	TX	6345	10185805
Methyl methanesulfonate	TX	6375	10185805
Naphthalene	TX	5005	10185805
Nitrobenzene	TX	5015	10185805
n-Nitrosodiethylamine	TX	6525	10185805
n-Nitrosodimethylamine	TX	6530	10185805
n-Nitrosodi-n-butylamine	TX	5025	10185805
n-Nitrosodi-n-propylamine	TX	6545	10185805
n-Nitrosodiphenylamine	TX	6535	10185805
n-Nitrosomethylethylamine	TX	6550	10185805
n-Nitrosomorpholine	TX	6555	10185805
n-Nitrosopiperidine	TX	6560	10185805
n-Nitrosopyrrolidine	TX	6565	10185805
Pentachlorobenzene	TX	6590	10185805
Pentachlorophenol	TX	6605	10185805
Phenanthrene	TX	6615	10185805
Phenol	TX	6625	10185805
Pyrene	TX	6665	10185805
Pyridine	TX	5095	10185805

Method EPA 9012

Analyte	**AB**	**Analyte ID**	**Method ID**
Amenable cyanide	TX	1510	10193405
Total cyanide	TX	1645	10193405

Method EPA 9023

Analyte	**AB**	**Analyte ID**	**Method ID**
Extractable organics halides (EOX)	TX	1720	10195003

Method EPA 9040

Analyte	**AB**	**Analyte ID**	**Method ID**
pH	TX	1900	10196802

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Matrix: ***Solid & Chemical Materials***

Method EPA 9045

Analyte	AB	Analyte ID	Method ID
pH	TX	1900	10197805

Method EPA 9056

Analyte	AB	Analyte ID	Method ID
Bromide	TX	1540	10199209
Chloride	TX	1575	10199209
Fluoride	TX	1730	10199209
Nitrate as N	TX	1810	10199209
Nitrate-nitrite	TX	1820	10199209
Nitrite as N	TX	1840	10199209
Orthophosphate as P	TX	1870	10199209
Sulfate	TX	2000	10199209

Method EPA 9071

Analyte	AB	Analyte ID	Method ID
n-Hexane Extractable Material (HEM) (O&G)	TX	1803	10201806

Method EPA 9095

Analyte	AB	Analyte ID	Method ID
Paint Filter Liquids Test	TX	10312	10204009

Method Iowa OA-2; DRO

Analyte	AB	Analyte ID	Method ID
Extractable Petroleum Hydrocarbons (EPH)	TX	10331	90016607

Method SM 2320 B

Analyte	AB	Analyte ID	Method ID
Alkalinity as CaCO3	TX	1505	20045005

Method SM 2510 B

Analyte	AB	Analyte ID	Method ID
Conductivity	TX	1610	20048004

Method SM 2540 G

Analyte	AB	Analyte ID	Method ID
Residue-total (total solids)	TX	1950	20005203

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Matrix: ***Solid & Chemical Materials***

Method SSA/ASA Part 3:34

Analyte	AB	Analyte ID	Method ID
Carbon, organic (Walkley-Black)	TX	10340	SSA/ASA Pt 3:34

Method TCEQ 1005

Analyte	AB	Analyte ID	Method ID
Total Petroleum Hydrocarbons (TPH)	TX	2050	90019208

Appendix F:

Raw Sampling Data

Appendix F: Raw Sampling Data

Monitoring Data Form Quarter 1 Data

				Composite																Grab			
Station ID	COG ID	Storm ID	Sampling Date	TDS (mg/L)	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Nitrogen Total (mg/L)	Nitrate N (mg/L)	Ammonia N (mg/L)	Ortho-phosphate (mg/L)	Phosphorus Dissolved (mg/L)	Phosphorus Total (mg/L)	Atrazine (µg/L)	Arsenic Total (mg/L)	Chromium Total (mg/L)	Copper Total (mg/L)	Lead Total (mg/L)	Zinc Total (mg/L)	Oil and Grease (mg/L)	Spec. Cond. (uS/cm)	pH (su)	*E. coli* (col/100 mL)
AR1901A	AR1901A		1/11/2019	772	19.8	< 2 U	16	1.50	0.43	0.18	< 0.05 U	< 0.100 U	0.058	< 0.100 U	< 0.002 U	< 0.004 U	0.00370	< 0.002 U	0.0211	2.92	1350	8.6	< 100.0
AR1902	AR1902		1/11/2019	770	23.6	2.53	21	2.30	0.52	0.13	< 0.05 U	< 0.100 U	0.081	< 0.100 U	< 0.002 U	< 0.004 U	0.00272	< 0.002 U	0.0183	2.92	1270	8.6	< 100.0
GA1901	GA1901		1/11/2019	214	23	3.29	26	2.00	1.22	0.18	< 0.05 U	< 0.100 U	0.089	< 0.100 U	< 0.002 U	< 0.004 U	0.00548	0.00253	0.036	< 2.00 U	709	8.0	< 100.0
GA1902	GA1902		1/11/2019	222	29.6	3.47	23	1.60	0.88	0.20	< 0.05 U	< 0.100 U	0.072	< 0.100 U	< 0.002 U	< 0.004 U	0.00422	< 0.002 U	0.0244	2.50	493	8.8	4800
GA1903	GA1903		1/11/2019	540	20	3.26	20	6.00	5.13	0.26	0.14	0.327	0.886	< 0.100 U	< 0.002 U	< 0.004 U	0.0104	< 0.002 U	0.0269	< 2.00 U	856	7.4	< 100.0
IR1901	IR1901		1/11/2019	232	104	6.04	45	2.20	0.83	0.99	< 0.05 U	0.240	0.358	< 0.100 U	< 0.002 U	0.00655	0.0108	0.00481	0.064	< 2.00 U	495	8.6	2000
IR1902	IR1902		1/11/2019	294	12.3	2.37	21	1.20	0.38	0.12	0.12	0.177	0.175	< 0.100 U	< 0.002 U	< 0.004 U	0.00209	< 0.002 U	0.012	2.08	508	5.5	300
MS1901	MS1901		2/7/2019	474	248	7.16	47	1.30	0.34	0.5	< 0.05 U	< 0.100 U	<0.050 U	< 0.100 U	< 0.002 U	< 0.004 U	0.00529	0.00557	0.0319	2.5	983	8.2	760.0
MS1902	MS1902		1/11/2019	484	14.8	< 2 U	18	1.30	0.63	0.1	< 0.05 U	0.241	<0.050 U	< 0.100 U	< 0.002 U	< 0.004 U	0.00327	< 0.002 U	<0.004 U	< 2.00 U	875	8.3	< 100.0
PL1901	PL1901		5/18/2019	171	324	12.4	29.0 J	2.3	0.69	0.16	0.11	0.0883 B J	0.42	< 0.531	0.0044	0.0075	0.012	0.0065	0.062	5.03	677	6.7	> 2419.6
NT1901	NT1901		1/11/2019	88	23.4	3.69	22	1.30	0.47	0.18	< 0.05 U	0.170	0.087	< 0.100 U	< 0.002 U	< 0.004 U	0.00351	< 0.002 U	0.0287	2.08	159	8.4	< 100.0
NT1902	NT1902		1/11/2019	122	38.3	4.68	26	1.30	0.54	0.14	< 0.05 U	< 0.100 U	0.057	< 0.100 U	< 0.002 U	< 0.004 U	0.0058	< 0.002 U	0.0417	< 2.00 U	283	8.3	< 100.0

Monitoring Data Form Quarter 2 Data

				Composite																Grab			
Station ID	COG ID	Storm ID	Sampling Date	TDS (mg/L)	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Nitrogen Total (mg/L)	Nitrate N (mg/L)	Ammonia N (mg/L)	Ortho-phosphate (mg/L)	Phosphorus Dissolved (mg/L)	Phosphorus Total (mg/L)	Atrazine (µg/L)	Arsenic Total (mg/L)	Chromium Total (mg/L)	Copper Total (mg/L)	Lead Total (mg/L)	Zinc Total (mg/L)	Oil and Grease (mg/L)	Spec. Cond. (uS/cm)	pH (su)	*E. coli* (col/100 mL)
AR1901A	AR1901A		5/8/2019	196	118	9.3	9	11.0	9.61	0.5	< 0.10 U	< 0.100 U	0.273	< 0.100 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	0.024	< 5 U	769	8.2	11200
AR1902	AR1902		4/13/2019	726	65	12.7	12	2.43	0.43	0.281	< 0.40 U	< 0.100 U	0.051	< 0.100 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	0.014	< 5 U	1128	8.2	2000
GA1901	GA1901		4/13/2019	676	65	11.8	72	0.97 J	0.38	1.364	< 0.40 U	< 0.100 U	0.056	< 0.100 U	<0.01 U	0.014	0.014	<0.01 U	0.061	< 5 U	635	7.6	< 1.000
GA1902	GA1902		4/13/2019	522	30	14.8	24	1.44	0.48	0.262	< 0.40 U	< 0.100 U	0.041 J	< 0.100 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	0.026	< 5 U	482	8.1	< 1.000
GA1903	GA1903		4/13/2019	188	88	22.4	28	1.69	0.29	1.03	< 0.40 U	0.098 J	0.582	< 0.100 U	<0.01 U	0.03	0.032	0.021	0.167	< 5 U	832	6.9	< 1.000
IR1901	IR1901		4/13/2019	196	620	35.2	77	1.58	0.38	0.451	< 0.40 U	< 0.100 U	0.037 J	< 0.100 U	<0.01 U	0.032	0.033	0.025	0.189	< 5 U	550	8.5	< 1.000
IR1902A	IR1902A		5/8/2019	144	267	7.8	15	1.30	0.38	0.21	0.26	0.046	0.306	< 0.100 U	<0.01 U	0.022	0.015	0.014	0.07	< 5 U	286	8.6	25600
MS1901	MS1901		5/8/2019	248	180	6.3	14	1.10	0.48	0.25	<0.25 U	< 0.100 U	0.151	< 0.100 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	0.031	< 5 U	607	8.3	3800
MS1902	MS1902		5/8/2019	224	160	6.8	14	1.30	0.73	< 0.05 U	<0.25 U	< 0.100 U	0.25	< 0.100 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	0.018	< 5 U	706	8.2	2200
PL1901	PL1901		5/8/2019	180	410	7	13	1.50	0.51	< 0.05 U	<0.25 U	< 0.100 U	0.340	< 0.100 U	<0.01 U	0.014	0.013	0.015	0.064	< 5 U	820	7.9	8800
NT1901	NT1901		4/13/2019	100	72	19	27	2.20	0.40	0.394	< 0.40 U	< 0.100 U	0.056	< 0.100 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	0.043	< 5 U	561	8.9	2000
NT1902	NT1902		4/13/2019	170	38	16.8	28	1.42	0.81	1.637	< 0.40 U	< 0.100 U	0.035	< 0.100 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	0.036	< 5 U	437	7.3	< 1.000

Monitoring Data Form Quarter 3 Data

				Composite																Grab			
Station ID	COG ID	Storm ID	Sampling Date	TDS (mg/L)	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Nitrogen Total (mg/L)	Nitrate N (mg/L)	Ammonia N (mg/L)	Orthophosphate (mg/L)	Phosphorus Dissolved (mg/L)	Phosphorus Total (mg/L)	Atrazine (µg/L)	Arsenic Total (mg/L)	Chromium Total (mg/L)	Copper Total (mg/L)	Lead Total (mg/L)	Zinc Total (mg/L)	Oil and Grease (mg/L)	Spec. Cond. (µS/cm)	pH (su)	*E. coli* *(col/100 mL)
AR1901A	AR1901A		7/10/2019	124	197	4.6	35.0	2.7	0.34	0.17	0.082	0.0460 J	0.56	0.04 J	0.00435	0.0164	0.0168	0.0159	0.0851	< 5.0 ND	239	8.4	1789
AR1902	AR1902		7/10/2019	156	325	8.7	35.0	3.6	0.38	0.18	0.042	0.0386 J	< 0.050 ND	0.058 J	0.00884	0.0257	0.0285	0.0175	0.161	< 5.7 ND	188	8.4	4352
GA1901	GA1901		8/3/2019	644	56.8	7.12	49	1.47	0.87	0.1458	< 0.03 U	0.100	0.090	< 0.010 U	< 0.004 U	0.004 J	0.018	< 0.004 U	0.090	< 1.12 U	588	7.7	4000
GA1902	GA1902		8/3/2019	304	46.6	7.3	54	1.27	0.67	0.2111	< 0.03 U	0.088	0.108	< 0.010 U	< 0.004 U	< 0.004 U	0.018	< 0.004 U	0.055	< 1.11 U	509	8.1	5600
GA1903	GA1903		8/3/2019	592	19.6	5.53	53	19.4	19.4	0.0575	2.54	3.00	2.86	< 0.010 U	< 0.004 U	< 0.004 U	0.016	< 0.004 U	0.029	< 1.11 U	963	7.2	5600
IR1901	IR1901		8/3/2019	452	396.8	21.8	211	2.12	0.12	0.1665	< 0.03 U	0.070	0.607	< 0.010 U	0.007 J	0.034	0.051	0.017	0.225	2.13 J	326	8.1	11200
IR1902A	IR1902A		7/10/2019	419	119	< 2.0 ND	44.1	1.7	0.22	0.11	< 0.040 ND	< 0.100 U	0.16	0.111	0.00422	0.0188	0.00506	0.00702	0.0351	< 4.9 ND	563	8.4	2755
MS1901	MS1901		8/3/2019	506	65.2	3.43	39	0.64	0.18	0.069 J	< 0.03 U	0.075	0.080	< 0.010 U	< 0.004 U	0.006 J	0.014	0.005 J	0.026	< 1.11 U	792	8.02	4600
MS1902	MS1902		8/3/2019	380	17.8	2.38	20	0.75	0.27	0.0602 J	< 0.03 U	0.060	0.060	< 0.010 U	< 0.004 U	< 0.004 U	< 0.01 U	< 0.004 U	0.017	1.56 J	681	7.88	1200
PL1901	PL1901		8/3/2019	222	130.2	17.1	90	0.67	0.68	0.0602 J	< 0.03 U	0.061	0.244	< 0.010 U	< 0.005 U	0.005 J	0.037	0.004 J	0.144	3.03	521	8.0	4000
NT1901	NT1901		8/3/2019	172	13.2	7.69	85	5.50	1.19	1.16	< 0.03 U	0.185	0.205	< 0.010 U	< 0.004 U	0.004 J	0.012	< 0.004 U	0.05	< 1.11 U	391	8.2	5200
NT1902	NT1902		7/10/2019	159	60.9	6.4	< 35.0 ND	1.7	0.28	0.12	< 0.040 ND	< 0.100 U	0.25	0.052 J	0.00582	0.0146	0.00744	0.00589	0.0451	< 5.3 ND	220	8.1	4352

*Samples from 7/10/19 reported in MPN/100 mL. Samples from 8/3/19 reported in CFU/100 mL.

Monitoring Data Form Quarter 4 Data

				Composite																Grab			
Station ID	COG ID	Storm ID	Sampling Date	TDS (mg/L)	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Nitrogen Total (mg/L)	Nitrate N (mg/L)	Ammonia N (mg/L)	Ortho phosphate (mg/L)	Phosphorus Dissolved (mg/L)	Phosphorus Total (mg/L)	Atrazine (µg/L)	Arsenic Total (mg/L)	Chromium Total (mg/L)	Copper Total (mg/L)	Lead Total (mg/L)	Zinc Total (mg/L)	Oil and Grease (mg/L)	Spec. Cond. (µS/cm)	pH (su)	*E. coli* (MPN/100 mL)
AR1901A	AR1901A		10/10/2019	146	438	16.4	34.1 J	3.4	0.47	0.27	0.13	0.17	0.65	0.056 J	0.0046	0.014	0.032	0.022	0.14	1.0 J	217	9.1	1413.6
AR1902	AR1902		10/10/2019	284	273	28.0	60.0	3.6	0.63	0.19	0.074	0.13	0.43	0.052 J	0.0050	0.0087	0.017	0.0084	0.12	1.9 J	461	8.8	> 2419.6
GA1901	GA1901		10/10/2019	186	48.0	12.9	40.6	2.3	0.56	0.13	0.030 J	0.14	0.18	0.046 J	0.0015	0.0039	0.015	0.0070	0.081	0.91 J	709	7.6	> 2419.6
GA1902	GA1902		10/10/2019	194	19.6	9.2	36.2	1.2	0.18	0.089 J	< 0.020	< 0.018	0.088	0.055 J	0.0017	0.0020 J	0.0077	0.0025	0.031	4.2 J	433	8.6	> 2419.6
GA1903	GA1903		10/10/2019	330	126	32.5	47.0	14.9	9.1	0.10	1.8	0.80	1.1	0.06 J	0.0028	0.0092	0.035	0.013	0.12	1.7 J	734	7.2	> 2419.6
IR1901	IR1901		10/10/2019	116	1440	16.9	57.8	6.0	0.46	0.25	0.082	0.59	0.88	0.095 J	0.0082	0.052	0.045	0.040	0.25	< 0.35	372	9.0	19863
IR1902A	IR1902A		10/10/2019	454	230	9.0	47.0	1.9	0.31	0.098 J	0.065	0.11	0.27	0.042 J	0.0026	0.0075	0.0062	0.0047	0.034	2.8 J	762	8.7	325.5
MS1902	MS1902		10/10/2019	280	129	3.5	38.4	1.4	0.53	0.18	0.16	0.021 J	0.15	0.091 J	0.0016	0.0024 J	0.0053	0.0028	0.014	< 0.38	489	8.4	162.6
PL1901	PL1901		10/10/2019	204	723	8.7	51.3	1.8	0.32	0.15	0.057	0.19	0.33	0.115	0.0048	0.011	0.013	0.011	0.067	< 0.36	471	8.3	> 2419.6
NT1901	NT1901		10/10/2019	277	408	21.7	62.1	4.3	0.87	0.26	0.086	0.045 J	0.47	0.07 J	0.0043	0.0083	0.024	0.0094	0.20	< 0.38	515	8.3	> 2419.6
NT1902	NT1902		10/10/2019	187	696	19.9	64.3	4.4	1.0	0.34	0.13	0.31	0.90	< 0.100	0.0065	0.022	0.028	0.012	0.17	< 0.36	349	8.4	6488
MS1901	MS1901		10/24/2019	118	118	7.5	31.9 J	2.0	0.31	0.20	< 0.020	0.16	0.31	< 0.100	0.0044	0.0091	0.012	0.0091	0.21	2.3 J	104	9.2	1986.3

Chemical Monitoring Data Form - Dallas

		Storm Summary										Composite																	Grab			
Station ID	Sampling Date	Storm Duration (hrs)	Rainfall Total (in)	Antecedent Dry Period (hrs)	1st Aliquot Collected	Last Aliquot Collected	# Aliquots Collected	Sample Volume (gal)	Ambient Air Temp (ºF)	Water Temp (ºF)	Sample Comments	TDS (mg/L)	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Nitrogen Total (mg/L)	Phosphorus Dissolved (mg/L)	Phosphorus Total (mg/L)	Orthophosphate (mg/L)	Ammonia Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	Atrazine (µg/L)	Carbaryl (µg/L)	Arsenic Total (mg/L)	Chromium Total (mg/L)	Copper Total (mg/L)	Lead Total (mg/L)	Zinc Total (mg/L)	Oil and Grease (mg/L)	Spec. Cond. (uS/cm)	pH Field (su)	E. coli (MPN/100 mL)
WRC-100-1	1/11/2019	2.0	0.50	98	8:27 PM	9:55 PM	5	4	51.8	55.58		243	26	<2.0	36.1	0.71	<0.050	0.071	N/A	N/A	N/A	N/A	<4.0	<0.020	<0.0070	<0.020	<0.010	<0.025	<2.6	366	7.68	71.2
WRC-200-1	1/11/2019	2.0	0.50	98	8:30 PM	9:58 PM	5	4	51.8	54.14		254	27	<2.0	<35.0	<0.010	<0.050	0.07	N/A	N/A	N/A	N/A	<4.0	<0.020	<0.0070	<0.020	<0.010	<0.025	<2.6	396	7.45	101.2
WRC-300-1	1/11/2019	2.0	0.50	98	8:39 PM	10:00 PM	5	4	51.8	56.66		277	25	2.1	<35.0	0.89	<0.050	0.071	N/A	N/A	N/A	N/A	<4.0	<0.020	<0.0070	<0.020	<0.010	<0.025	<2.6	419	7.61	77.6
FMC-100-1	2/7/2019	1.5	0.60	630	5:06 AM	6:30 AM	5	4	57.38	63.68		322	64	2.7	<35.0	4.1	0.063	0.21	N/A	N/A	N/A	N/A	<4.0	<0.020	<0.0070	<0.020	<0.010	<0.025	<2.6	622	7.56	181.2
FMC-200-1	2/7/2019	1.5	0.60	630	5:05 AM	6:26 AM	5	4	55.58	60.44		324	89	<2.0	<35.0	2.1	0.14	0.2	N/A	N/A	N/A	N/A	<4.0	<0.020	<0.0070	<0.020	<0.010	<0.025	<4.6	570	7.86	<1
FMC-300-1	2/7/2019	1.5	0.60	630	5:05 AM	6:25 AM	5	4	55.76	61.7		320	133	<2.0	45.9	2	0.11	0.18	N/A	N/A	N/A	N/A	<4.0	<0.020	<0.0070	<0.020	<0.010	0.029	<2.6	647	7.49	104.6
FMC-100-1 (Field Dup)	2/7/2019	1.5	0.60	630	5:06 AM	6:30 AM	5	4	57.38	63.32		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<2.6	638	7.55	90.8
WRC-100-2	4/6/2019	1.5	0.64	287	10:45 AM	12:16 PM	5	4	66.56	66.56		314	29	31	24.4	0.52	<0.050	0.064	0.043	<0.13	0.5	1.2	<4.1	<0.020	<0.0070	<0.020	<0.010	<0.025	<2.8	500	6.93	>2419.6
WRC-200-2	4/6/2019	1.5	0.64	287	10:45 AM	12:13 PM	5	4	66.56	64.04		308	49	36	28.7	1	<0.050	0.14	0.072	<0.13	0.47	0.85	<4.0	<0.020	<0.0070	<0.020	<0.010	<0.025	<2.6	444	6.94	110.6
WRC-300-2	4/6/2019	1.5	0.64	287	10:40 AM	12:10 PM	5	4	66.56	64.22		315	29	29	21	0.52	<0.050	0.087	0.054	<0.13	0.5	0.89	<4.0	<0.020	<0.0070	<0.020	<0.010	<0.025	31.2	458	6.96	866.4
FMC-100-2	4/18/2019	2.0	0.84	100	1:30 AM	3:00 AM	5	4	63.0	66.74		176	155	5	21.3	3.1	0.12	0.9	0.068	<0.13	1.4	0.3	<4.2	<0.020	0.0082	<0.020	0.013	0.036	<2.7	560	7.36	1960.8
FMC-200-2	4/18/2019	2.0	0.84	100	1:41 AM	3:14 AM	5	4	63.0	66.2		228	246	8	20	3.5	0.11	0.35	0.068	<0.13	1.5	0.5	<4.1	<0.020	<0.0070	<0.020	<0.010	<0.025	<2.7	582	7.58	1413.6
FMC-300-2	4/18/2019	2.0	0.84	100	1:33 AM	3:05 AM	5	4	63.0	64.94		246	134	5	<20	3.1	0.092	0.23	0.061	<0.13	1.3	0.2	<4.0	<0.020	<0.0070	0.027	<0.010	0.038	2.6	651	7.44	770.1
WRC-100-3	8/27/2019	4.0	0.16	573	7:48 AM	9:03 AM	5	4	73	79.52		282	74	7	47.8	1.3	0.13	0.19	0.065	0.1	0.3	<0.10	<4.0	<0.020	<0.0070	<0.020	<0.010	<0.025	<5.2	383	7.63	>2419.6
WRC-200-3	8/27/2019	4.0	0.16	573	7:45 AM	9:04 AM	5	4	73	80.24		216	41	3	46.2	0.77	0.058	0.13	<0.040	<0.08	0.13	<0.10	<4.3	<0.020	<0.0070	<0.020	<0.010	<0.025	<5.1	369	7.55	920.8
WRC-300-3	8/27/2019	4.0	0.16	573	7:45 AM	9:04 AM	5	4	74	76.64		262	49	<5	44.5	0.53	0.17	0.13	0.09	0.09	0.48	<0.10	<4.0	<0.020	<0.0070	<0.020	<0.010	<0.025	<5.2	451	7.7	63.8
FMC-100-3	10/10/2019	1.5	1.80	146	9:43 PM	11:09 PM	5	4	62.6	68.72		137	933	26.9	77.2	4	0.91	0.92	0.23	0.43	2.9	<0.10	<4.0	<0.020	0.014	0.024	0.029	0.097	<5.0	124.3	8.24	24196
FMC-200-3	10/11/2019	1.5	1.80	146	9:44:00 PM(10/10)	11:06 PM	5	4	60.8	72.68		188	51	14.1	47	1.4	0.37	0.38	0.18	0.16	0.47	<0.10	<4.0	<0.020	<0.0070	<0.020	<0.010	0.045	<5.1	148	8.01	>2419.6
FMC-300-3	10/11/2019	1.5	1.80	146	9:44:00 PM(10/10)	11:05 PM	5	4	60.8	73.22		241	94	12.6	<35.0	0.65	0.18	0.2	0.096	0.11	0.64	<0.10	<4.0	<0.020	<0.0070	<0.020	<0.010	0.031	<5.0	708	7.9	129.6
FMC-100-3 (Field Dup)	10/10/2019	1.5	1.80	146	9:43 PM	11:09 PM	5	4	62.6	69.8		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5.1	121.8	7.85	>24196
WRC-100-4	10/24/2019	10.5	1.72	87	4:54 PM	6:41 PM	5	4	62.6	67.64		200	44	6.4	<35.0	0.9	0.13	0.19	<0.040	<0.10	<0.050	<0.11	<3.9	<0.020	<0.0070	<0.020	<0.010	<0.025	<5.0	307	8.31	248.1
WRC-200-4	10/24/2019	10.5	1.72	87	4:57 PM	6:49 PM	5	4	62.6	65.84		188	110	6.1	<35.0	0.8	0.12	0.2	0.11	0.1	0.11	<0.10	<4.0	<0.020	<0.0070	<0.020	<0.010	0.025	<5.0	283	8.19	913.9
WRC-300-4	10/24/2019	10.5	1.72	87	4:55 PM	6:21 PM	5	4	62.6	65.3		275	40	5.3	<35.0	0.76	0.093	0.12	0.049	0.24	0.13	<0.10	<4.0	<0.020	<0.0070	<0.020	<0.010	<0.025	<5.0	338	8.05	>2429.6
FMC-100-4	11/7/2019	8.0	0.44	162	5:01 AM	6:20 AM	5	4	64	62.78		230	70	3.8	<35.0	0.13	0.07	0.26	0.061	<0.10	0.13	<0.10	<4.4	<0.020	<0.0070	<0.020	<0.010	<0.025	<5.1	409	7.45	2406.6
FMC-200-4	11/7/2019	8.0	0.44	162	5:03 AM	6:23 AM	5	4	64	63.68		221	21	2.7	<35.0	0.35	0.14	0.21	0.13	0.1	0.3	<0.096	<3.9	<0.020	<0.0070	<0.020	<0.010	<0.025	<5.2	330	7.94	291
FMC-300-4	11/7/2019	8.0	0.44	162	5:07 AM	6:27 AM	5	4	64	65.48		239	74	5.2	<35.0	0.46	0.06	0.19	0.047	0.11	0.44	<0.10	<4.1	<0.020	<0.0070	<0.020	<0.010	0.032	<5.0	347	7.62	248

2019 Fort Worth Regional Wet Weather Characterization Plan

Monitoring Data Spreadsheet

Station ID	Sampling Date	Rainfall Total (in)	Ambient Air Temp (ºF)	TDS (mg/L)	TSS (mg/L)	BOD (mg/L)	COD (mg/L)	Nitrogen Total (mg/L)	Ammonia Nitrogen (mg/L)	Phosphorus Dissolved (mg/L)	Phosphorus Total (mg/L)	Atrazine (ug/L)	Nitrate (mg/L)	Nitrite (mg/L)	Orthophosphate (mg/L)	Arsenic Total (mg/L)	Chromium Total (mg/L)	Copper Total (mg/L)	Lead Total (mg/L)	Zinc Total (mg/L)	Oil and Grease (mg/L)	Spec. Cond. (uS/cm)	pH (su)	E. coli (MPN/100 mL)	Total coliforms (MPN/100 mL)
MAR1	24/Oct/19	1.14	59.7	256	44.8	3.4	33	<0.50	<0.150	0.0420	<1.00	<1.00	0.27	0.007	<0.10	<0.005	<0.005	<0.005	<0.005	0.013	<5.00	470	8.11	770	13000
MAR3	7/Nov/19	0.74	64.1	180	182	5.2	34	0.61	<0.150	0.0321	<1.00	<1.04	0.58	0.027	<0.10	<0.005	0.006	0.01	0.008	0.033	<5.00	320	7.96	308	57900
OVR1	7/Nov/19	0.74	64.1	161	35.6	4.8	33	<0.50	<0.150	0.0269	<1.00	<1.05	0.43	0.014	<0.10	<0.005	<0.005	<0.005	<0.005	0.017	<5.00	460	7.9	5650	77000
OVR3*	N/A*																								

*OVR3 was not successfully sampled due to sampling unit failures on November 7, 2019, December 10, 2019, and sampling unit tampering on January 16, 2020. Sampling will be completed in 2020.

Appendix G:

Sample Collection Reports

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG REGIONAL STORMWATER MONITORING PROGRAM
PROJECT ID 100063022
CITY OF PLANO

Sample Collection Report
Event Date: May 18, 2019

Storm Summary

Storm description: A large storm system moved into the eastern half of the region from the west bringing moderate to heavy rainfall.

Rain event start time and date:	1300 05/18/19	Rainfall total:	2.62 in
Rain event end time and date:	1520 05/18/19	Peak 1-hr rate:	2.20 in/hr

Rainfall station:	PL 1901
Antecedent dry period:	170 hrs

Comments: The antecedent dry period was calculated using a combination of data from the weather station KTXPLANO394 located in North Dallas Estates (www.wunderground.com/weatherstation) and PL 1901.

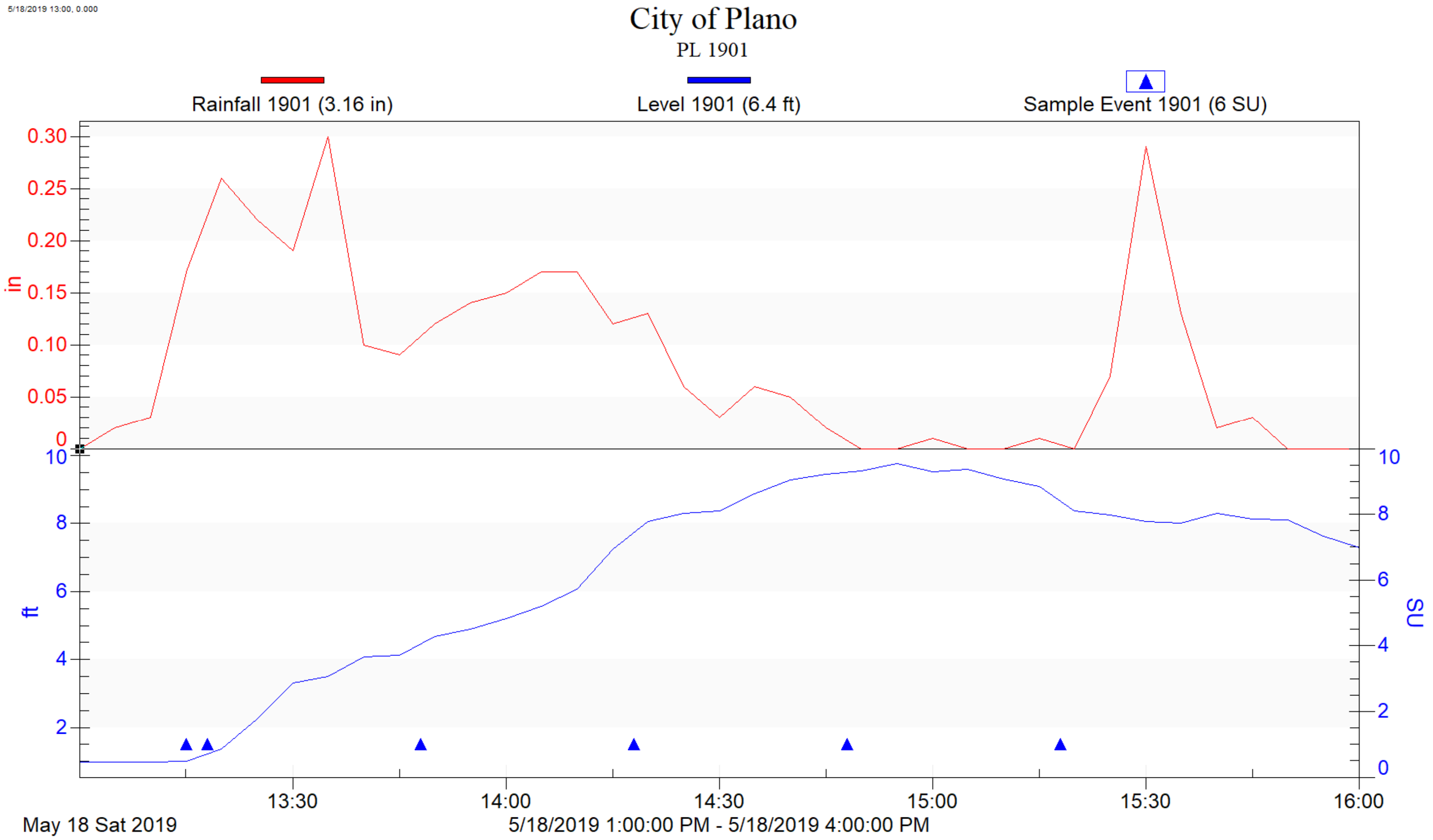
PL 1901

Station location description:	Spring Creek at 16th Street		
Flow start time and date:	1310 05/18/19		
Flow end time and date:	1600 05/18/19		
Time first aliquot collected:	1315 05/18/19		
Time last aliquot collected:	1518 05/18/19		
Peak depth:	9.8 ft	Aliquots collected:	6
Average depth:	6.4 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, and average depth are the result of the sampling equipment being removed at the conclusion of the sampling activities.

Prepared By: Adam Gottlieb Date: May 20, 2019

Checked By: Kofi Sam Date: June 17, 2019


5/18/2019 13:00, 0.000
City of Plano
PL 1901
Rainfall 1901 (3.16 in)
Level 1901 (6.4 ft)
Sample Event 1901 (6 SU)
in
0.30
0.25
0.20
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16:00
May 18 Sat 2019
5/18/2019 1:00:00 PM - 5/18/2019 4:00:00 PM

Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

CITY OF PLANO 2019

Storm Event: 5/18/2019 Project Number: 100063022	**PL 1901**	
PARAMETER NAME	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	171	mg/L
Total Suspended Solids (TSS)	324	mg/L
Biochemical Oxygen Demand (BOD)	12.4	mg/L
Chemical Oxygen Demand (COD)	29.0 J	mg/L
Total Nitrogen	2.3	mg/L
Nitrate N	0.69	mg/L
Ammonia N	0.16	mg/L
Orthophosphate	0.11	mg/L
Phosphorus, Dissolved	0.0883 B J	mg/L
Phosphorus, Total	0.42	mg/L
Atrazine	< 0.531	µg/L
Arsenic, Total	0.0044	mg/L
Chromium, Total	0.0075	mg/L
Copper, Total	0.012	mg/L
Lead, Total	0.0065	mg/L
Zinc, Total	0.062	mg/L
PARAMETER NAME	**GRAB**	**UNIT**
Oil & Grease(HEM)	5.03	mg/L
pH	6.7	su
Ambient Air Temperature (field)	67	°F
Water Temperature (field)	70.0	°F
E. Coli	> 2419.6	col/100 mL
Specific Conductivity	677	µS/cm

B - The same analyte is found in the associated blank
">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG Regional Stormwater Monitoring Program
NCTCOG PROJECT ID 100063022
City of Arlington 2019

Sample Collection Report
Event Date: May 8, 2019

Storm Summary
Storm description: Heavy rain moving from south to north.

Rain event start time and date: 0440 05/08/19 Rainfall total: 1.16 in
Rain event end time and date: 0510 05/08/19 Peak 1-hr rate: 1.16 in/hr

Rainfall station: Johnson Creek @ Sanford Road (6500)
Antecedent dry period: 93 hrs

Comments: Antecedent dry period determined by Johnson Creek @ Sanford Road (6500) from https://gptx.onerain.com. Rain event start and end time determined by initial storm event. Additional rain occurred later; however, this rain event is not applicable to the stormwater samples collected.

AR 1901A
Station location description: Johnson Creek @ East Sanford Road

Flow start time and date: 0445 05/08/19 Time first aliquot collected: 0449 05/08/19
Flow end time and date: 0900 05/08/19 Time last aliquot collected: 0655 05/08/19

Peak depth:	7.177 ft	Aliquots collected:	6
Average depth:	3.304 ft	Total sample volume:	3.5 gal

Comments: The flow end time and average depth were determined to be prior to the second rise in level in the hydrograph. The initial rise is most applicable to sample collection.

AR 1902
Station location description: Fish Creek @ 360/Kingwood Blvd

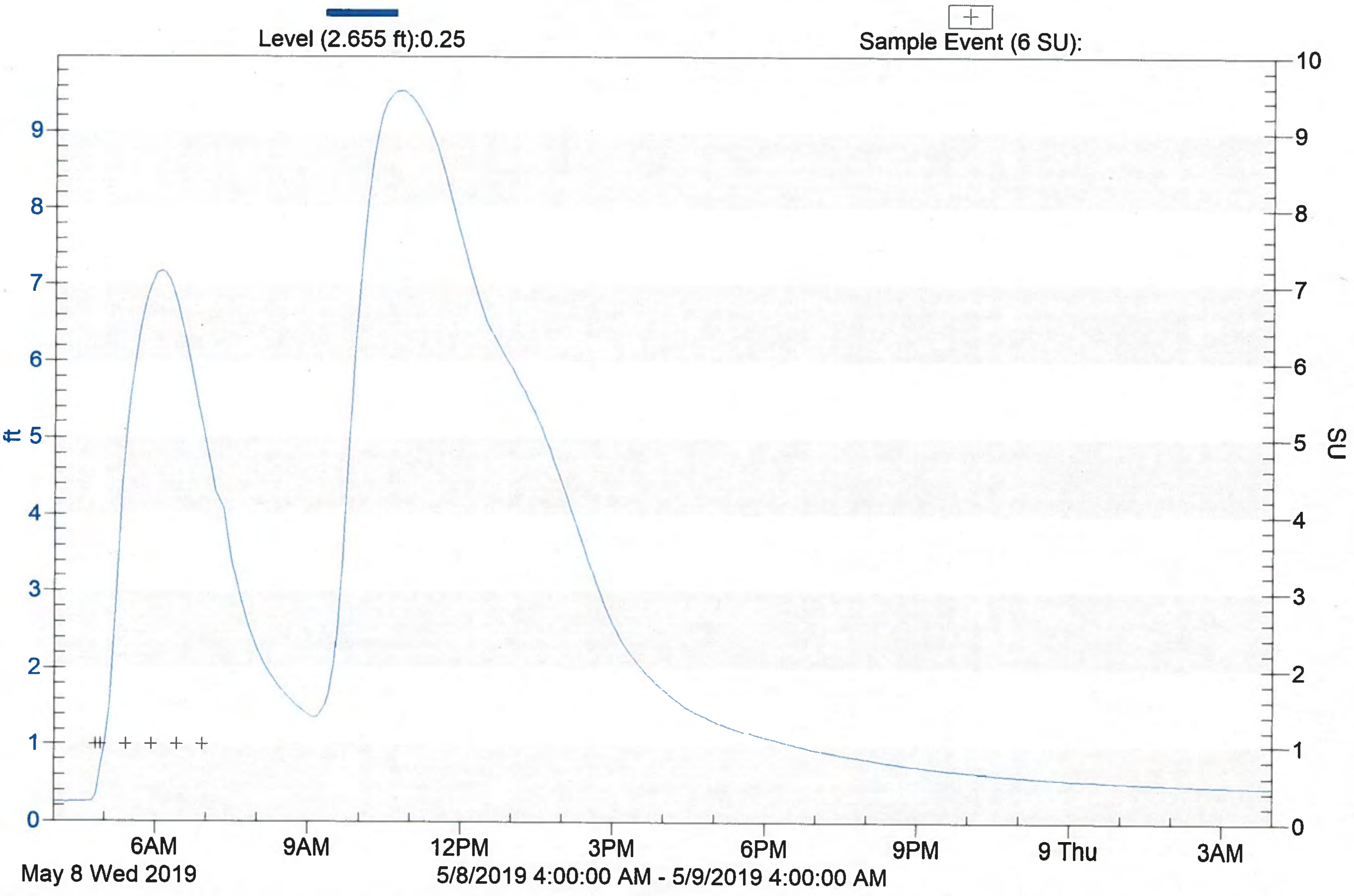
Comments: AR1902 sample was collected on April 13, 2019; therefore, no samples were collected at this site on May 8, 2019.

Prepared By: Ryan Deal Date: 06/11/19

Checked By: Charles Daddy Date: 06/11/2019

Arlington Johnson Creek

AR1901A



Analytical Results Summary
NCTCOG Regional Stormwater Monitoring Program
NCTCOG Project 100063022
CITY OF ARLINGTON 2019

Storm Event: 5/8/2019 Project Number: 100063022	**AR 1901A**	**AR 1902**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	196	N/A	mg/L
Total Suspended Solids (TSS)	118	N/A	mg/L
Biochemical Oxygen Demand (BOD)	9.3	N/A	mg/L
Chemical Oxygen Demand (COD)	9	N/A	mg/L
Total Nitrogen	11.0	N/A	mg/L
Nitrate N	9.61	N/A	mg/L
Ammonia N	0.5	N/A	mg/L
Orthophosphate	< 0.10 U	N/A	mg/L
Phosphorus, Dissolved	< 0.100 U	N/A	mg/L
Phosphorus, Total	0.273	N/A	mg/L
Atrazine	< 0.100 U	N/A	µg/L
Arsenic, Total	<0.01 U	N/A	mg/L
Chromium, Total	<0.01 U	N/A	mg/L
Copper, Total	<0.01 U	N/A	mg/L
Lead, Total	<0.01 U	N/A	mg/L
Zinc, Total	0.024	N/A	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	< 5 U	N/A	mg/L
pH	8.2	N/A	su
Ambient Air Temperature (field)	65.2	N/A	°F
Water Temperature (field)	72.1	N/A	°F
E. Coli	11200	N/A	col/100 mL
Specific Conductivity	769	N/A	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG Regional Stormwater Monitoring Program
NCTCOG PROJECT ID 100063022
City of Arlington 2019

Sample Collection Report
Event Date: April 13, 2019

Storm Summary

Storm description: Moderate rain moving from south to north.

Rain event start time and date: 0508 04/13/19 Rainfall total: 1.51 in
Rain event end time and date: 2110 04/13/19 Peak 1-hr rate: 0.50 in/hr

Rainfall station: Arlington Municipal Airport (KGKY)
Antecedent dry period: 114 hrs

Comments: Antecedent dry period determined by Arlington Municipal Airport (KGKY) from http://texmesonet.org/.

AR 1901A

Station location description: Johnson Creek @ East Sanford Road

Comments: Sample collection efforts were attempted on April 13, 2019. Upon arrival at the site, sample jars were filled. The sample report revealed sample collection initiation began on the afternoon of April 12, 2019 shortly after program start time. A 1-inch rise in water level had occurred prior to extra jars being available to replace for sample collection.

AR 1902

Station location description: Fish Creek @ 360/Kingwood Blvd

Flow start time and date: 0525 04/13/19 Time first aliquot collected: 0557 04/13/19
Flow end time and date: 0455 04/15/19 Time last aliquot collected: 0803 04/13/19

Peak depth: 4.401 ft Aliquots collected: 6
Average depth: 1.415 ft Total sample volume: 3.5 gal

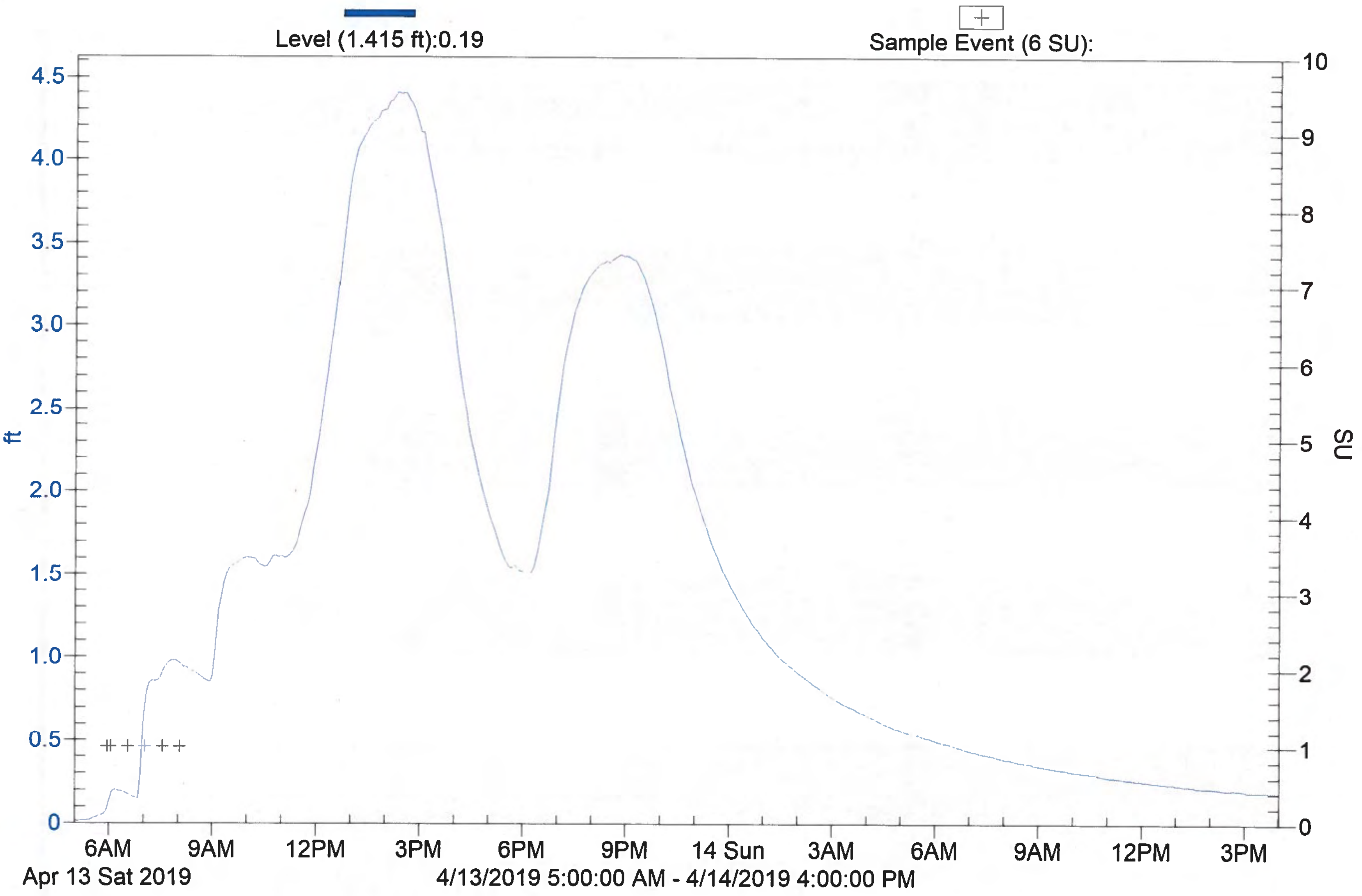
Comments: None

Prepared By: Ryan Deal Date: 04/22/19

Checked By: Charles P Addy Date: 04/22/2019

Arlington Fish Creek

AR1902-2



Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

CITY OF ARLINGTON 2019

Storm Event: 4/13/2019 Project Number: 100063022	**AR 1901A**	**AR 1902**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	N/A	726	mg/L
Total Suspended Solids (TSS)	N/A	65	mg/L
Biochemical Oxygen Demand (BOD)	N/A	12.7	mg/L
Chemical Oxygen Demand (COD)	N/A	12	mg/L
Total Nitrogen	N/A	2.43	mg/L
Nitrate N	N/A	0.43	mg/L
Ammonia N	N/A	0.281	mg/L
Orthophosphate	N/A	< 0.40 U	mg/L
Phosphorus, Dissolved	N/A	< 0.100 U	mg/L
Phosphorus, Total	N/A	0.051	mg/L
Atrazine	N/A	< 0.100 U	µg/L
Arsenic, Total	N/A	<0.01 U	mg/L
Chromium, Total	N/A	<0.01 U	mg/L
Copper, Total	N/A	<0.01 U	mg/L
Lead, Total	N/A	<0.01 U	mg/L
Zinc, Total	N/A	0.014	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	N/A	< 5 U	mg/L
pH	N/A	8.2	su
Ambient Air Temperature (field)	N/A	58	°F
Water Temperature (field)	N/A	61.5	°F
E. Coli	N/A	2000	col/100 mL
Specific Conductivity	N/A	1128	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG REGIONAL STORMWATER MONITORING PROGRAM
PROJECT ID 100063022
CITY OF GARLAND

Sample Collection Report
Event Date: April 13, 2019

Storm Summary

Storm description: A storm system formed south of the DFW area and moved north across the metroplex bringing moderate to heavy rainfall.

Rain event start time and date:	0540 04/13/19	Rainfall total:	0.48 in
Rain event end time and date:	0800 04/13/19	Peak 1-hr rate:	0.35 in/hr

Rainfall station:	GA 1901
Antecedent dry period:	128 hrs

Comments: None.

GA 1901

Station location description:	Duck Creek between Forest North and South
Flow start time and date:	0555 04/13/19
Flow end time and date:	0800 04/13/19
Time first aliquot collected:	0555 04/13/19
Time last aliquot collected:	0758 04/13/19

Peak depth:	1.6 ft	Aliquots collected:	6
Average depth:	0.9 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, peak depth, and average depth are a result of the sampling equipment being removed at the conclusion of the sampling activities.

GA 1902

Station location description: Duck Creek at Rick Oden Park/Briarwood Drive

Flow start time and date: 0610 04/13/19
Flow end time and date: 0825 04/13/19

Time first aliquot collected: 0615 04/13/19
Time last aliquot collected: 0819 04/13/19

Peak depth: 3.8 ft Aliquots collected: 6
Average depth: 2.5 ft Total sample volume: 3.5 gal

Comments: Flow end time and date, peak depth, and average depth are a result of the sampling equipment being removed at the conclusion of the sampling activities.

GA 1903

Station location description: Duck Creek under La Prada Bridge

Flow start time and date: 0600 04/13/19
Flow end time and date: 0910 04/13/19

Time first aliquot collected: 0604 04/13/19
Time last aliquot collected: 0807 04/13/19

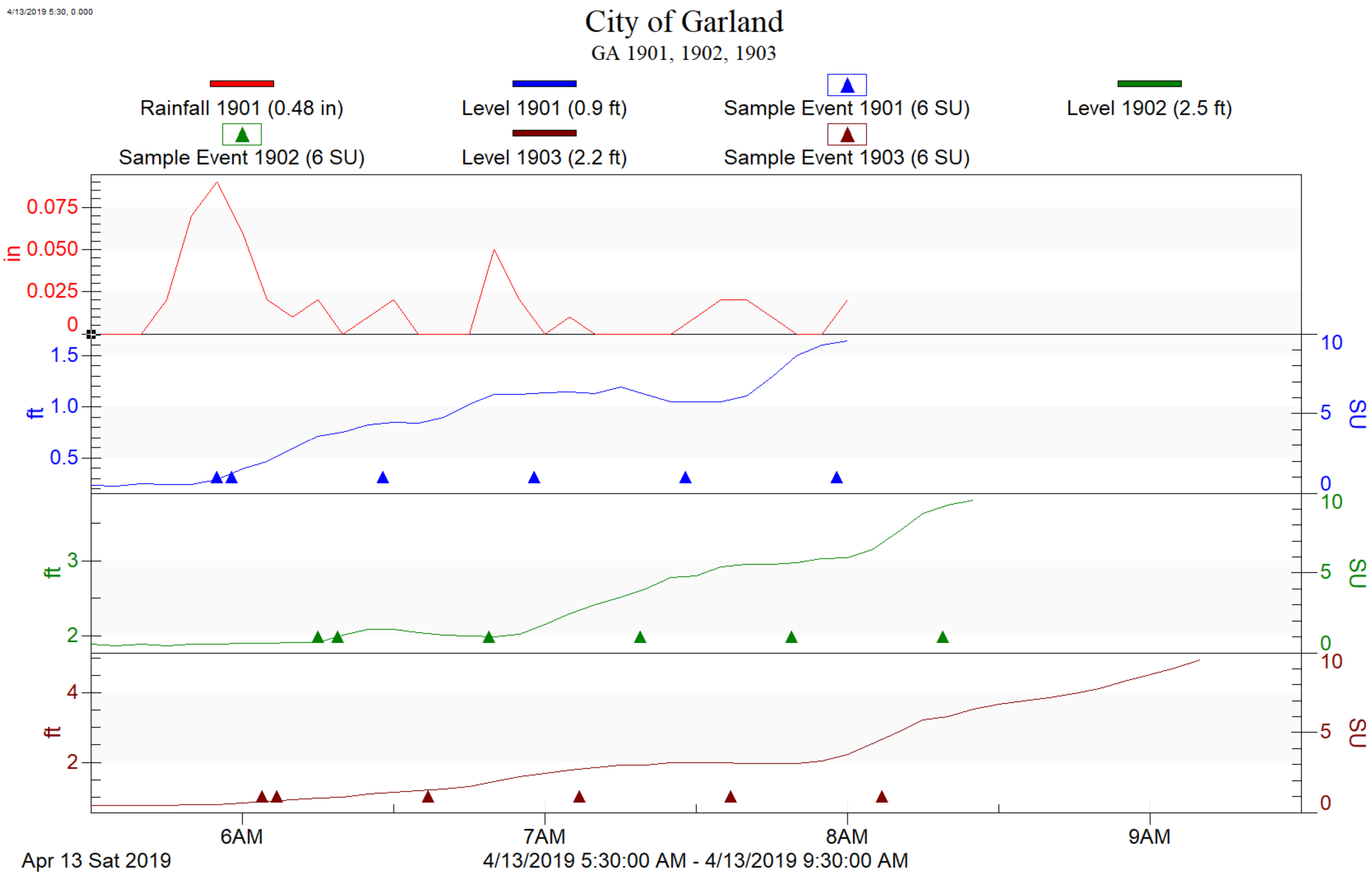
Peak depth: 4.9 ft Aliquots collected: 6
Average depth: 2.2 ft Total sample volume: 3.5 gal

Comments: Flow end time and date, peak depth, and average depth are a result of the sampling equipment being removed at the conclusion of the sampling activities.

Prepared By: Adam Gottlieb Date: April 15, 2019

Checked By: Kofi Sam Date: June 17, 2019

Sample Collection Report
City of Garland
Event Date: April 13, 2019



Analytical Results Summary
NCTCOG Regional Stormwater Monitoring Program
NCTCOG Project 100063022
CITY OF GARLAND 2019

Storm Event: 4/13/2019 Project Number: 100063022	GA 1901	GA 1902	GA 1903	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	676	522	188	mg/L
Total Suspended Solids (TSS)	65	30	88	mg/L
Biochemical Oxygen Demand (BOD)	11.8	14.8	22.4	mg/L
Chemical Oxygen Demand (COD)	72	24	28	mg/L
Total Nitrogen	0.97 J	1.44	1.69	mg/L
Nitrate N	0.38	0.48	0.29	mg/L
Ammonia N	1.364	0.262	1.03	mg/L
Orthophosphate	< 0.40 U	< 0.40 U	< 0.40 U	mg/L
Phosphorus, Dissolved	< 0.100 U	< 0.100 U	0.098 J	mg/L
Phosphorus, Total	0.056	0.041 J	0.582	mg/L
Atrazine	< 0.100 U	< 0.100 U	< 0.100 U	µg/L
Arsenic, Total	<0.01 U	<0.01 U	<0.01 U	mg/L
Chromium, Total	0.014	<0.01 U	0.03	mg/L
Copper, Total	0.014	<0.01 U	0.032	mg/L
Lead, Total	<0.01 U	<0.01 U	0.021	mg/L
Zinc, Total	0.061	0.026	0.167	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	< 5 U	< 5 U	< 5 U	mg/L
pH	7.6	8.1	6.9	su
Ambient Air Temperature (field)	58	58	57	°F
Water Temperature (field)	61.4	60.4	63.2	°F
E. Coli	< 1.000	< 1.000	< 1.000	col/100 mL
Specific Conductivity	635	482	832	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG STORMWATER QUALITY MONITORING PROJECT
NCTCOG PROJECT ID 100063022
City of Irving 2019

Sample Collection Report
Event Date: April 13, 2019

Storm Summary

Storm description: Moderate rain moving from south to north.

Rain event start time and date: 0532 04/13/19 Rainfall total: 1.8 in
Rain event end time and date: 2335 04/13/19 Peak 1-hr rate: 0.44 in/hr

Rainfall station: DFW International Airport (KDFW)
Antecedent dry period: 127.5 hrs

Comments: Antecedent dry period determined from DFW International Airport (KDFW) from http://texmesonet.org/.

IR 1901

Station location description: Delaware Creek @ North Sowers Road

Flow start time and date: Unknown Time first aliquot collected: 0542 04/13/19
Flow end time and date: Unknown Time last aliquot collected: 0748 04/13/19

Peak depth: Unknown Aliquots collected: 6
Average depth: Unknown Total sample volume: 3.5 gal

Comments: Sampler data was unable to be downloaded due to an internal battery failure. However, samples were collected successfully, and sample times were recorded in the field at the time of sampling.

IR 1902

Station location description: Delaware Creek @ East Oakdale Road

Comments: Three attempts were made to manually trigger sampler based on visual observation of rise. All attempts were unsuccessful at pumping water from the stream. Following those attempts, the sampler then initiated sampling automatically with the same result. Further investigation revealed a blockage in the suction line. Issue has been resolved.

Prepared By: Ryan Deal Date: 04/22/19
Checked By: Charles I Daddy Date: 04/22/2019

Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

CITY OF IRVING 2019

Storm Event: 4/13/2019 Project Number: 100063022	**IR 1901**	**IR 1902A**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	196	N/A	mg/L
Total Suspended Solids (TSS)	620	N/A	mg/L
Biochemical Oxygen Demand (BOD)	35.2	N/A	mg/L
Chemical Oxygen Demand (COD)	77	N/A	mg/L
Total Nitrogen	1.58	N/A	mg/L
Nitrate N	0.38	N/A	mg/L
Ammonia N	0.451	N/A	mg/L
Orthophosphate	< 0.40 U	N/A	mg/L
Phosphorus, Dissolved	< 0.100 U	N/A	mg/L
Phosphorus, Total	0.037 J	N/A	mg/L
Atrazine	< 0.100 U	N/A	µg/L
Arsenic, Total	<0.01 U	N/A	mg/L
Chromium, Total	0.032	N/A	mg/L
Copper, Total	0.033	N/A	mg/L
Lead, Total	0.025	N/A	mg/L
Zinc, Total	0.189	N/A	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	< 5 U	N/A	mg/L
pH	8.5	N/A	su
Ambient Air Temperature (field)	55	N/A	°F
Water Temperature (field)	61	N/A	°F
E. Coli	< 1.000	N/A	col/100 mL
Specific Conductivity	550	N/A	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG STORMWATER QUALITY MONITORING PROJECT
NCTCOG PROJECT ID 100063022
City of Irving 2019

Sample Collection Report
Event Date: May 8, 2019

Storm Summary

Storm description: Heavy rain moving from south to north.

Rain event start time and date: 0440 05/08/19 Rainfall total: 0.97 in
Rain event end time and date: 0655 05/08/19 Peak 1-hr rate: 0.96 in/hr

Rainfall station: DFW International Airport (KDFW)
Antecedent dry period: 94.5 hrs

Comments: Antecedent dry period determined from DFW International Airport (KDFW) from http://texmesonet.org/. Rain event start and end time determined by initial storm event. Additional rain occurred later; however, this rain event is not applicable to the stormwater samples collected.

IR 1901

Station location description: Delaware Creek @ North Sowers Road

Comments: IR1901 sample was collected on April 13, 2019; therefore, no samples were collected at this site on May 8, 2019.

IR 1902A

Station location description: Delaware Creek @ Maple Street

Flow start time and date: 0450 05/08/19 Time first aliquot collected: 0502 05/08/19
Flow end time and date: 0930 05/08/19 Time last aliquot collected: 0708 05/08/19

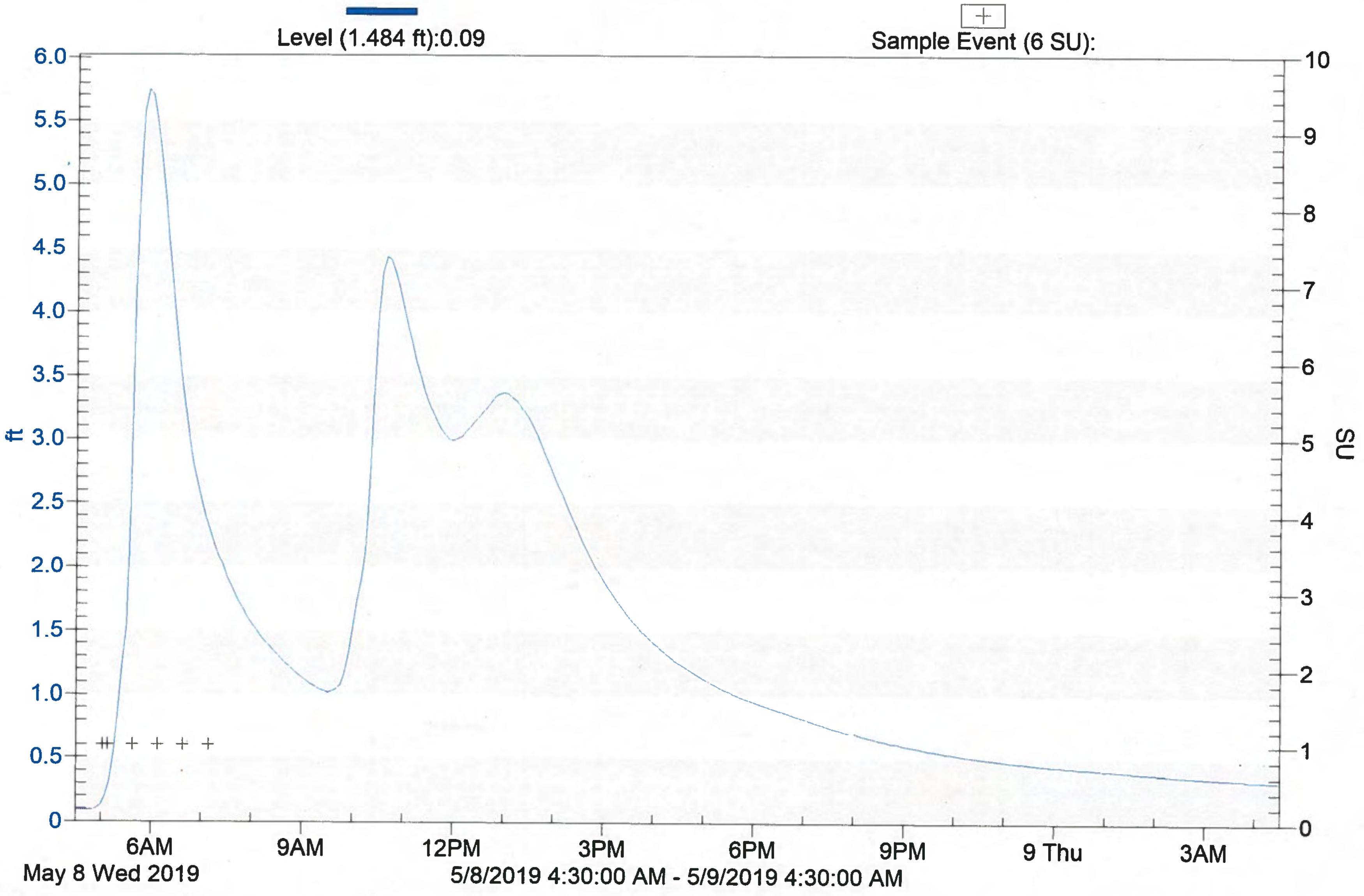
Peak depth: 5.742 ft Aliquots collected: 6
Average depth: 2.047 ft Total sample volume: 3.5 gal

Comments: Prior to this sample event, IR1902 was relocated upstream of the Oakdale Road bridge to Maple Street. IR1902 will now be labeled as IR1902A. The flow end time and average depth were determined to be prior to the second rise in level in the hydrograph. The initial rise is most applicable to sample collection.

Prepared By: Ryan Deal Date: 06/11/19
Checked By: Charles P Gaddy Date: 06/11/2019

Irving Delaware Creek

IR1902A-2



Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

CITY OF IRVING 2019

Storm Event: 5/8/2019 Project Number: 100063022	**IR 1901**	**IR 1902A**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	N/A	144	mg/L
Total Suspended Solids (TSS)	N/A	267	mg/L
Biochemical Oxygen Demand (BOD)	N/A	7.8	mg/L
Chemical Oxygen Demand (COD)	N/A	15	mg/L
Total Nitrogen	N/A	1.30	mg/L
Nitrate N	N/A	0.38	mg/L
Ammonia N	N/A	0.21	mg/L
Orthophosphate	N/A	0.26	mg/L
Phosphorus, Dissolved	N/A	0.046	mg/L
Phosphorus, Total	N/A	0.306	mg/L
Atrazine	N/A	< 0.100 U	µg/L
Arsenic, Total	N/A	<0.01 U	mg/L
Chromium, Total	N/A	0.022	mg/L
Copper, Total	N/A	0.015	mg/L
Lead, Total	N/A	0.014	mg/L
Zinc, Total	N/A	0.07	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	N/A	< 5 U	mg/L
pH	N/A	8.6	su
Ambient Air Temperature (field)	N/A	64	°F
Water Temperature (field)	N/A	72	°F
E. Coli	N/A	25600	col/100 mL
Specific Conductivity	N/A	286	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG REGIONAL STORMWATER MONITORING PROGRAM
PROJECT ID 100063022
CITY OF MESQUITE

Sample Collection Report
Event Date: May 8, 2019

Storm Summary

Storm description: A large storm system covered the entire DFW area while moving southeast across the metroplex.

Rain event start time and date:	0540 05/08/19	Rainfall total:	0.68 in
Rain event end time and date:	0645 05/08/19	Peak 1-hr rate:	0.68 in/hr

Rainfall station:	MS 1902
Antecedent dry period:	95 hrs

Comments: The antecedent dry period was calculated using a combination of data from the KTXMESQU27 weather station located at the Municipal Center (www.wunderground.com/weatherstation) and MS 1902.

MS 1901

Station location description:	North of New Market Road		
Flow start time and date:	0545 05/08/19		
Flow end time and date:	0800 05/08/19		
Time first aliquot collected:	0548 05/08/19		
Time last aliquot collected:	0751 05/08/19		
Peak depth:	6.6 ft	Aliquots collected:	6
Average depth:	3.9 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, peak depth, and average depth are a result of the sampling equipment being removed at the conclusion of the sampling activities.

MS 1902

Station location description: North Mesquite Creek at Edward’s Church

Flow start time and date: 0600 05/08/19
Flow end time and date: 0830 05/08/19

Time first aliquot collected: 0605 05/08/19
Time last aliquot collected: 0809 05/08/19

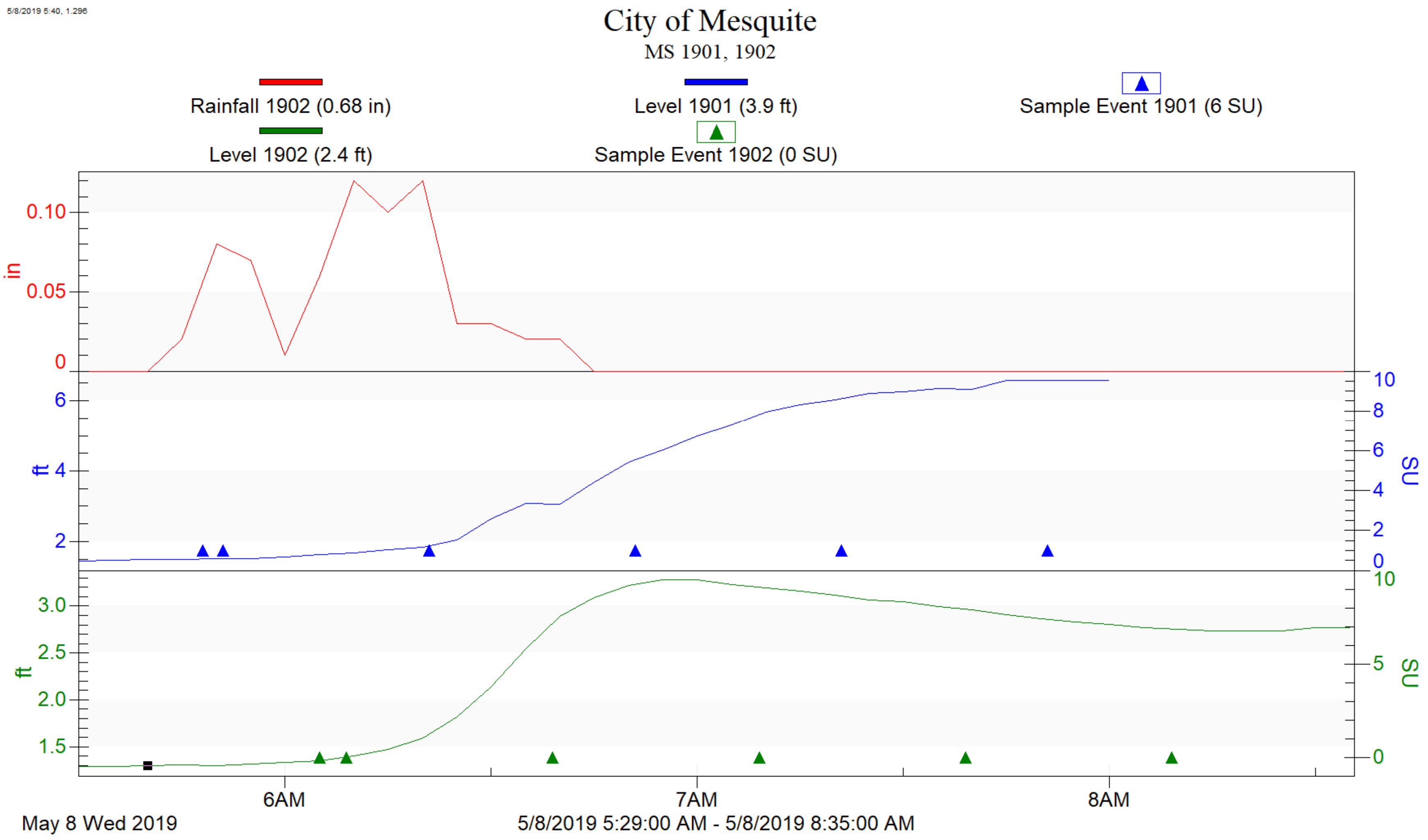
Peak depth:	3.3 ft	Aliquots collected:	6
Average depth:	2.4 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date are a result of the sampling equipment being removed at the conclusion of the sampling activities.

Prepared By: Adam Gottlieb Date: May 8, 2019

Checked By: Kofi Sam Date: June 17, 2019

Sample Collection Report
City of Mesquite
Event Date: May 8, 2019



Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

CITY OF MESQUITE 2019

Storm Event: 5/8/2019 Project Number: 100063022	**MS 1901**	**MS 1902**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	248	224	mg/L
Total Suspended Solids (TSS)	180	160	mg/L
Biochemical Oxygen Demand (BOD)	6.3	6.8	mg/L
Chemical Oxygen Demand (COD)	14	14	mg/L
Total Nitrogen	1.10	1.30	mg/L
Nitrate N	0.48	0.73	mg/L
Ammonia N	0.25	< 0.05 U	mg/L
Orthophosphate	<0.25 U	<0.25 U	mg/L
Phosphorus, Dissolved	< 0.100 U	< 0.100 U	mg/L
Phosphorus, Total	0.151	0.252	mg/L
Atrazine	< 0.100 U	< 0.100 U	µg/L
Arsenic, Total	<0.01 U	<0.01 U	mg/L
Chromium, Total	<0.01 U	<0.01 U	mg/L
Copper, Total	<0.01 U	<0.01 U	mg/L
Lead, Total	<0.01 U	<0.01 U	mg/L
Zinc, Total	0.031	0.018	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	< 5 U	< 5 U	mg/L
pH	8.3	8.2	su
Ambient Air Temperature (field)	66	66	°F
Water Temperature (field)	70.6	69.5	°F
E. Coli	3800	2200	col/100 mL
Specific Conductivity	607	706	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG REGIONAL STORMWATER MONITORING PROGRAM
PROJECT ID 100063022
NORTH TEXAS TOLLWAY AUTHORITY

Sample Collection Report
Event Date: April 13, 2019

Storm Summary

Storm description: A storm system formed south of the DFW area and moved north across the metroplex bringing moderate to heavy rainfall.

Rain event start time and date:	0535 04/13/19	Rainfall total:	0.45 in
Rain event end time and date:	0900 04/13/19	Peak 1-hr rate:	0.36 in/hr

Rainfall station: NTTA 1901
Antecedent dry period: 127 hrs

Comments: None.

NTTA 1901

Station location description: Unnamed Tributary at SH 161 N. of Gateway Dr.

Flow start time and date: 0545 04/13/19
Flow end time and date: 0900 04/13/19

Time first aliquot collected: 0547 04/13/19
Time last aliquot collected: 0750 04/13/19

Peak depth:	2.0 ft	Aliquots collected:	6
Average depth:	1.1 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, and average depth are the result of the sampling equipment being removed at the conclusion of the sampling activities.

Storm Summary

Storm description: A storm system formed south of the DFW area and moved north across the metroplex bringing moderate to heavy rainfall.

Rain event start time and date:	0511 04/13/19	Rainfall total:	0.44 in
Rain event end time and date:	0906 04/13/19	Peak 1-hr rate:	0.20 in/hr

Rainfall station:	GPTX 6080
Antecedent dry period:	159 hrs

Comments: The antecedent dry period was calculated using data from the 6080 weather station located at N Cottonwood and Great Southwest Parkway (https://gptx.onerain.com/home.php).

NTTA 1902

Station location description: Cottonwood Creek at SH 161 S. of Dickey Road

Flow start time and date:	0520 04/13/19
Flow end time and date:	0835 04/13/19

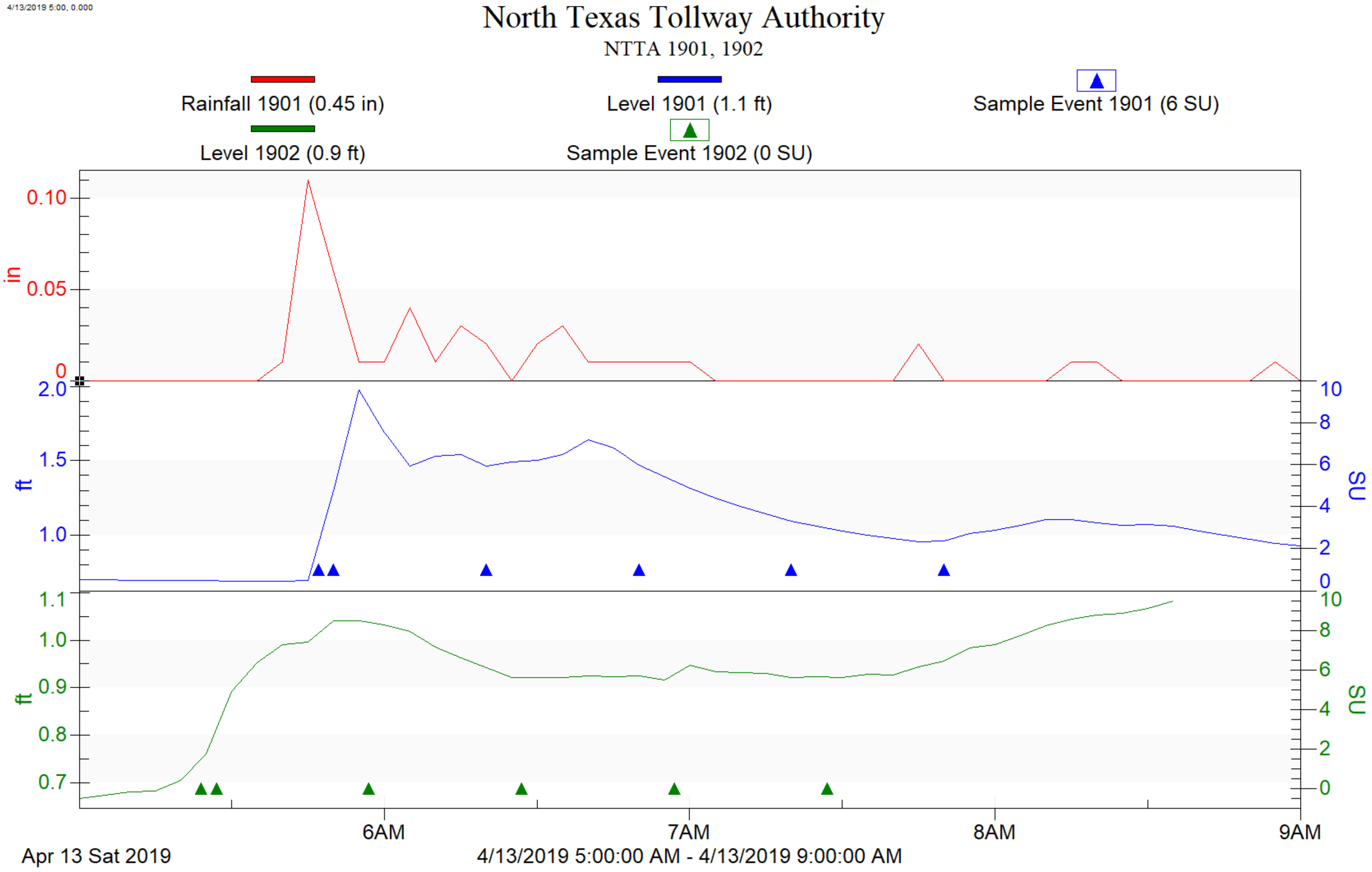
Time first aliquot collected:	0524 04/13/19
Time last aliquot collected:	0727 04/13/19

Peak depth:	1.1 ft	Aliquots collected:	6
Average depth:	0.9 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, peak depth, and average depth are the result of the sampling equipment being removed at the conclusion of the sampling activities.

Prepared By: Adam Gottlieb Date: April 15, 2019

Checked By: Kofi Sam Date: June 17, 2019


4/13/2019 5:00, 0.000
North Texas Tollway Authority
NTTA 1901, 1902
Rainfall 1901 (0.45 in)
Level 1901 (1.1 ft)
Sample Event 1901 (6 SU)
Level 1902 (0.9 ft)
Sample Event 1902 (0 SU)
in
0.10
0.05
0
ft
2.0
1.5
1.0
SU
10
8
6
4
2
0
ft
1.1
1.0
0.9
0.8
0.7
SU
10
8
6
4
2
0
6AM
7AM
8AM
9AM
Apr 13 Sat 2019
4/13/2019 5:00:00 AM - 4/13/2019 9:00:00 AM

Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

NORTH TEXAS TOLLWAY AUTHORITY 2019

Storm Event: 4/13/2019 Project Number: 100063022	**NTTA 1901**	**NTTA 1902**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	100	170	mg/L
Total Suspended Solids (TSS)	72	38	mg/L
Biochemical Oxygen Demand (BOD)	19	16.8	mg/L
Chemical Oxygen Demand (COD)	27	28	mg/L
Total Nitrogen	2.20	1.42	mg/L
Nitrate N	0.40	0.81	mg/L
Ammonia N	0.394	1.637	mg/L
Orthophosphate	< 0.40 U	< 0.40 U	mg/L
Phosphorus, Dissolved	< 0.100 U	< 0.100 U	mg/L
Phosphorus, Total	0.056	0.035	mg/L
Atrazine	< 0.100 U	< 0.100 U	µg/L
Arsenic, Total	<0.01 U	<0.01 U	mg/L
Chromium, Total	<0.01 U	<0.01 U	mg/L
Copper, Total	<0.01 U	<0.01 U	mg/L
Lead, Total	<0.01 U	<0.01 U	mg/L
Zinc, Total	0.043	0.036	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	< 5 U	< 5 U	mg/L
pH	8.91	7.3	su
Ambient Air Temperature (field)	56	56	°F
Water Temperature (field)	62.4	63.9	°F
E. Coli	2000	< 1.000	col/100 mL
Specific Conductivity	561	437	µS/cm

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J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG REGIONAL STORMWATER MONITORING PROGRAM
PROJECT ID 100063022
CITY OF PLANO

Sample Collection Report
Event Date: May 8, 2019

Storm Summary

Storm description: A large storm system covered the entire DFW area while moving southeast across the metroplex.

Rain event start time and date:	0445 05/08/19	Rainfall total:	0.72 in
Rain event end time and date:	0605 05/08/19	Peak 1-hr rate:	0.71 in/hr

Rainfall station:	PL 1901
Antecedent dry period:	145 hrs

Comments: None.

PL 1901

Station location description: Spring Creek at 16th Street

Flow start time and date:	0450 05/08/19
Flow end time and date:	0655 05/08/19

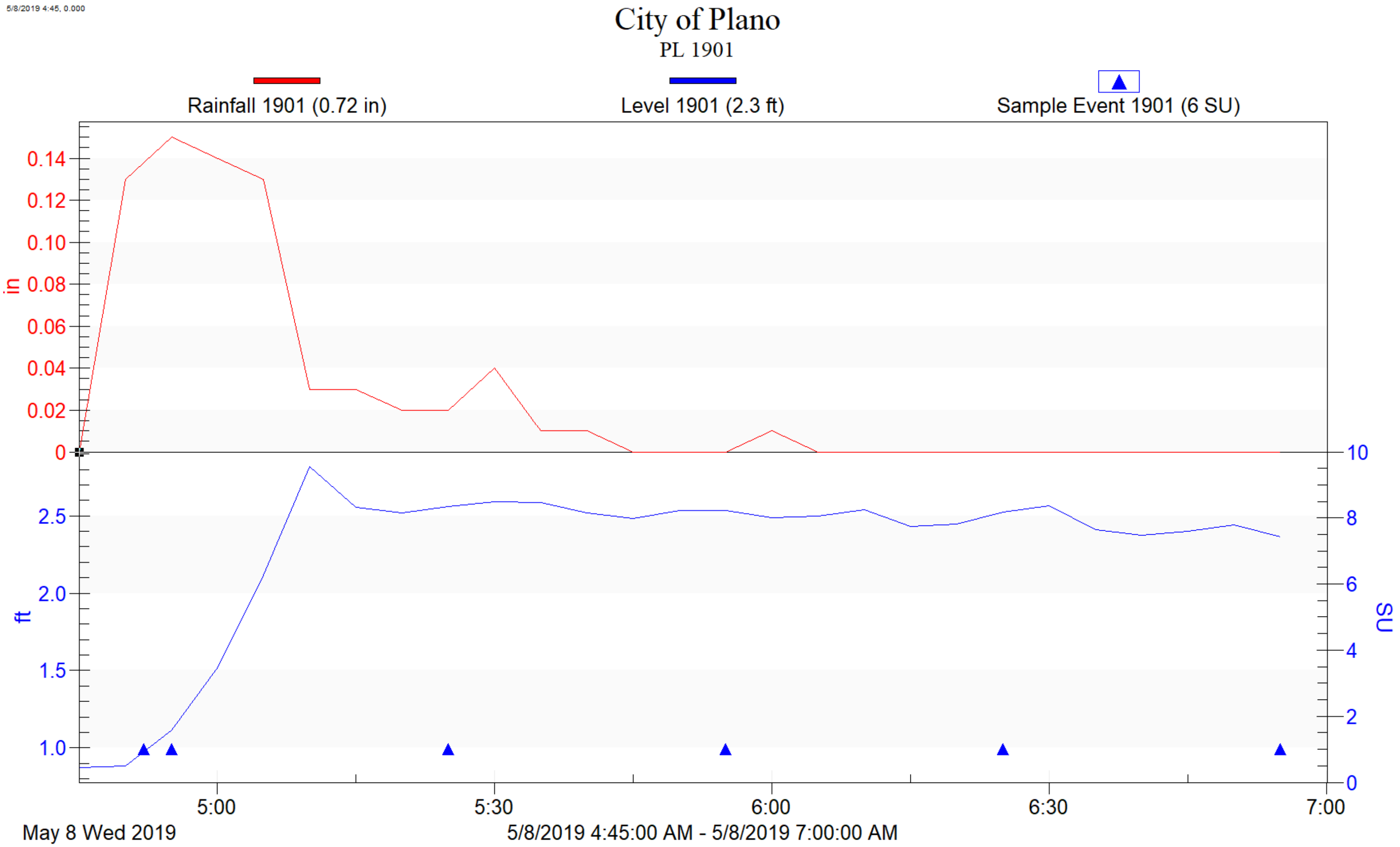
Time first aliquot collected:	0452 05/08/19
Time last aliquot collected:	0655 05/08/19

Peak depth:	2.8 ft	Aliquots collected:	6
Average depth:	2.3 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, and average depth are the result of the sampling equipment removed at the conclusion of the sampling activities.

Prepared By: Adam Gottlieb Date: May 9, 2019

Checked By: Kofi Sam Date: June 17, 2019


5/8/2019 4:45, 0.000
City of Plano
PL 1901
Rainfall 1901 (0.72 in)
Level 1901 (2.3 ft)
Sample Event 1901 (6 SU)
in
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0
ft
2.5
2.0
1.5
1.0
SU
10
8
6
4
2
0
5:00
5:30
6:00
6:30
7:00
May 8 Wed 2019
5/8/2019 4:45:00 AM - 5/8/2019 7:00:00 AM

Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

CITY OF PLANO 2019

Storm Event: 5/8/2019 Project Number: 100063022	**PL 1901**	
PARAMETER NAME	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	180	mg/L
Total Suspended Solids (TSS)	410	mg/L
Biochemical Oxygen Demand (BOD)	7	mg/L
Chemical Oxygen Demand (COD)	13	mg/L
Total Nitrogen	1.50	mg/L
Nitrate N	0.51	mg/L
Ammonia N	< 0.05 U	mg/L
Orthophosphate	<0.25 U	mg/L
Phosphorus, Dissolved	< 0.100 U	mg/L
Phosphorus, Total	0.340	mg/L
Atrazine	< 0.100 U	μg/L
Arsenic, Total	<0.01 U	mg/L
Chromium, Total	0.014	mg/L
Copper, Total	0.013	mg/L
Lead, Total	0.015	mg/L
Zinc, Total	0.064	mg/L
PARAMETER NAME	**GRAB**	**UNIT**
Oil & Grease(HEM)	< 5 U	mg/L
pH	7.9	su
Ambient Air Temperature (field)	64	°F
Water Temperature (field)	71.2	°F
E. Coli	8800	col/100 mL
Specific Conductivity	820	μS/cm

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J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG Regional Stormwater Monitoring Program
NCTCOG PROJECT ID 100063022
City of Arlington 2019

Sample Collection Report
Event Date: July 10, 2019

Storm Summary
Storm description: Heavy rain moving slowly from north to south.

Rain event start time and date: 1735 07/10/19 Rainfall total: 1.96 in
Rain event end time and date: 1915 07/10/19 Peak 1-hr rate: 1.20 in/hr

Rainfall station: Johnson Creek @ East Sanford Road (6500)
Antecedent dry period: 96 hrs

Comments: Antecedent dry period determined by Johnson Creek @ Sanford Road (6500) from https://gptx.onerain.com/home.php.

AR 1901A
Station location description: Johnson Creek @ East Sanford Road

Flow start time and date: 1740 07/10/19 Time first aliquot collected: 1745 07/10/19
Flow end time and date: 0350 07/12/19 Time last aliquot collected: 1951 07/10/19

Peak depth: 4.97 ft Aliquots collected: 6
Average depth: 1.012 ft Total sample volume: 3.5 gal

Comments: None

Storm Summary
Storm description: Heavy rain moving slowly from north to south.

Rain event start time and date: 1850 07/10/19 Rainfall total: 0.91 in
Rain event end time and date: 1930 07/10/19 Peak 1-hr rate: 0.91 in/hr

Rainfall station: Arlington Municipal Airport (KGKY)
Antecedent dry period: 95.5 hrs

Comments: Antecedent dry period determined by Arlington Municipal Airport (KGKY) from https://mesowest.utah.edu.

AR 1902

Station location description: Fish Creek @ Highway 360/Kingswood Blvd

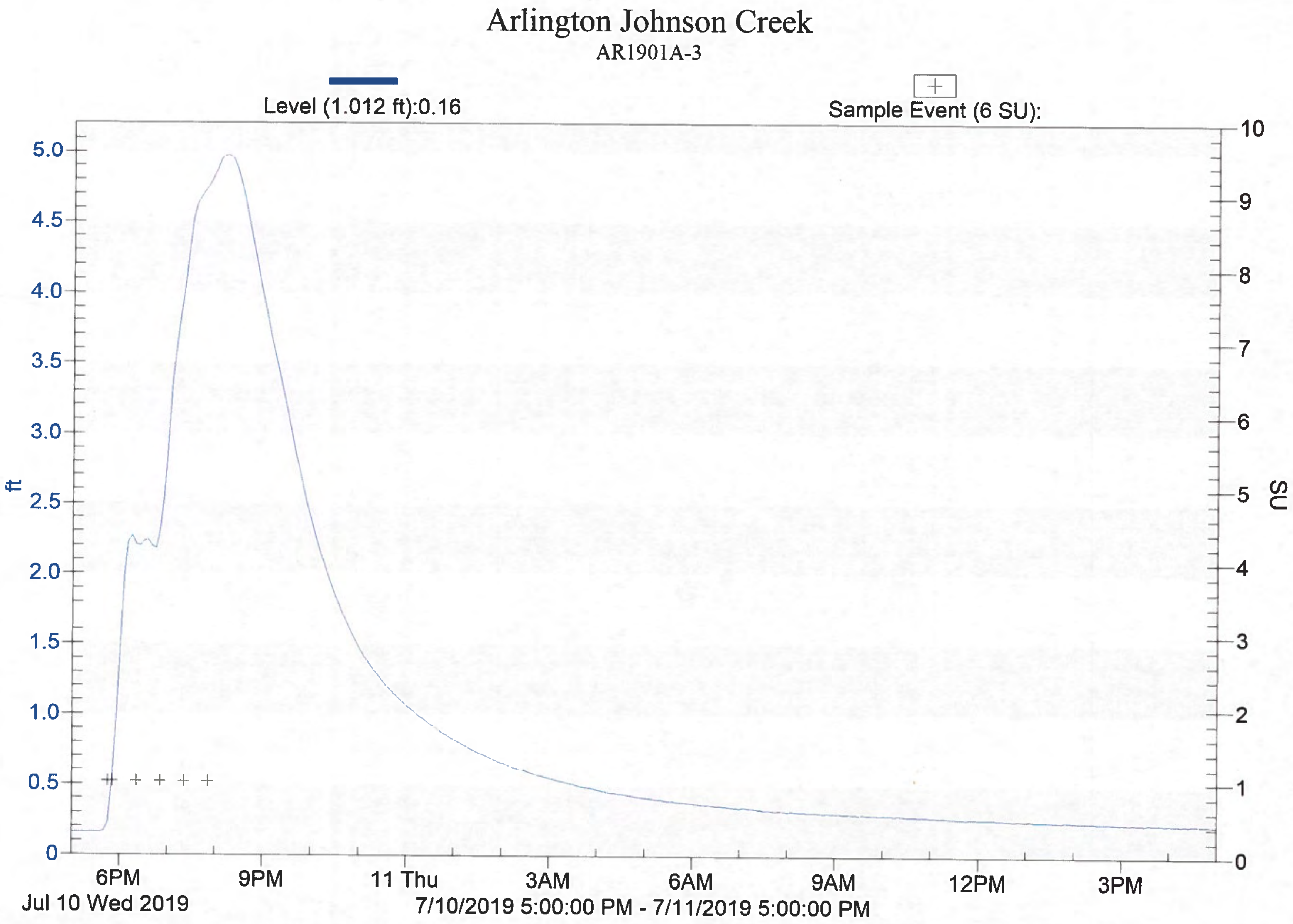
Flow start time and date:	1854 07/10/19	Time first aliquot collected:	1854 07/10/19
Flow end time and date:	1750 07/11/19	Time last aliquot collected:	2100 07/10/19

Peak depth:	3.48 ft	Aliquots collected:	6
Average depth:	0.574 ft	Total sample volume:	3.5 gal

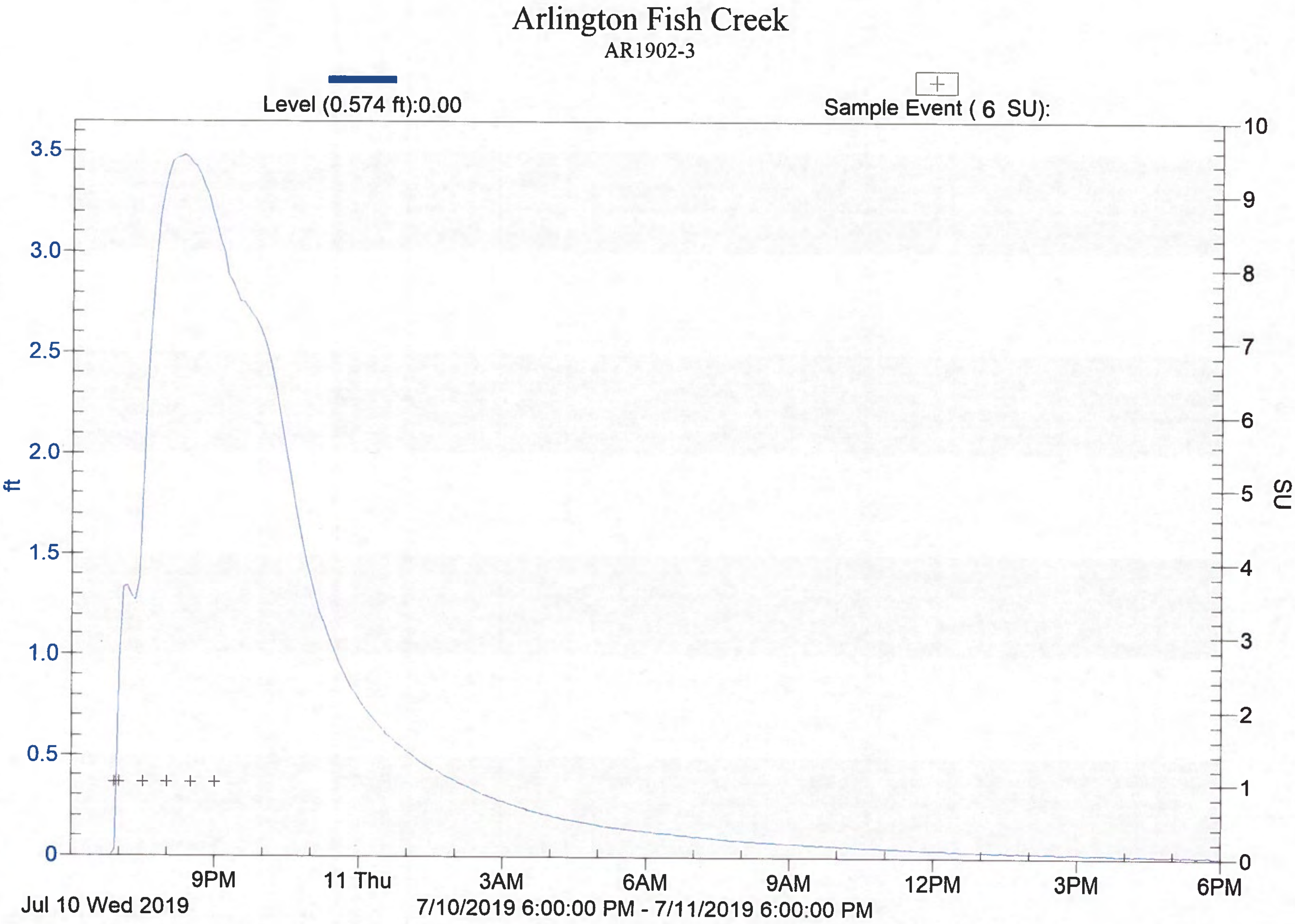
Comments: None

Prepared By: Ryan Deal Date: 8/20/19

Checked By: Charles Gaddy Date: 8/27/19



Arlington Johnson Creek
AR1901A-3
Level (1.012 ft):0.16
Sample Event (6 SU):
ft
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0
SU
10
9
8
7
6
5
4
3
2
1
0
6PM
Jul 10 Wed 2019
9PM
11 Thu
3AM
6AM
9AM
12PM
3PM
7/10/2019 5:00:00 PM - 7/11/2019 5:00:00 PM


Arlington Fish Creek
AR1902-3
Level (0.574 ft):0.00
Sample Event (6 SU):
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0
ft
10
9
8
7
6
5
4
3
2
1
0
SU
9PM
11 Thu
3AM
6AM
9AM
12PM
3PM
6PM
Jul 10 Wed 2019
7/10/2019 6:00:00 PM - 7/11/2019 6:00:00 PM

Analytical Results Summary
NCTCOG Regional Stormwater Monitoring Program
NCTCOG Project 100063022
CITY OF ARLINGTON 2019

Storm Event: 7/10/2019 Project Number: 100063022	**AR 1901A**	**AR 1902**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	124	156	mg/L
Total Suspended Solids (TSS)	197	325	mg/L
Biochemical Oxygen Demand (BOD)	4.6	8.7	mg/L
Chemical Oxygen Demand (COD)	< 35.0 ND	< 35.0 ND	mg/L
Total Nitrogen	2.7	3.6	mg/L
Nitrate N	0.34	0.38	mg/L
Ammonia N	0.17	0.18	mg/L
Orthophosphate	0.082	0.042	mg/L
Phosphorus, Dissolved	0.0460 J	0.0386 J	mg/L
Phosphorus, Total	0.56	< 0.050 ND	mg/L
Atrazine	0.04 J	0.058 J	µg/L
Arsenic, Total	0.00435	0.00884	mg/L
Chromium, Total	0.0164	0.0257	mg/L
Copper, Total	0.0168	0.0285	mg/L
Lead, Total	0.0159	0.0175	mg/L
Zinc, Total	0.0851	0.161	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	< 5.0 ND	< 5.7 ND	mg/L
pH	8.4	8.4	su
Ambient Air Temperature (field)	76	72	°F
Water Temperature (field)	88.7	83.6	°F
E. Coli	1789	4352	MPN/100 mL
Specific Conductivity	239	188	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected
ND - Not Detected at or above adjusted reporting limit

ATKINS
Member of the SNC-Lavalin Group

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG REGIONAL STORMWATER MONITORING PROGRAM
PROJECT ID 100063022
CITY OF GARLAND

Sample Collection Report
Event Date: August 3, 2019

Storm Summary

Storm description: A large storm system covered the entire DFW area while moving southeast across the metroplex.

Rain event start time and date:	0710 08/03/19	Rainfall total:	0.70 in
Rain event end time and date:	1025 08/03/19	Peak 1-hr rate:	0.30 in/hr

Rainfall station:	GA 1901
Antecedent dry period:	828 hrs

Comments: The antecedent dry period was calculated using a combination of data from GA 1901 and the weather station KTXGARLA21 located at Shorehaven, Garland (www.wunderground.com/weatherstation).

GA 1901

Station location description:	Duck Creek between Forest North and South

Flow start time and date:	0735 08/03/19
Flow end time and date:	1025 08/03/19

Time first aliquot collected:	0809 08/03/19
Time last aliquot collected:	1012 08/03/19

Peak depth:	0.8 ft	Aliquots collected:	6
Average depth:	0.5 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, peak depth, and average depth are a result of the sampling equipment being removed at the conclusion of the sampling activities.

GA 1902

Station location description:	Duck Creek at Rick Oden Park/Briarwood Drive		
Flow start time and date:	0825 08/03/19		
Flow end time and date:	1050 08/03/19		
Time first aliquot collected:	0827 08/03/19		
Time last aliquot collected:	1031 08/03/19		
Peak depth:	0.6 ft	Aliquots collected:	6
Average depth:	0.3 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, peak depth, and average depth are a result of the sampling equipment being removed at the conclusion of the sampling activities.

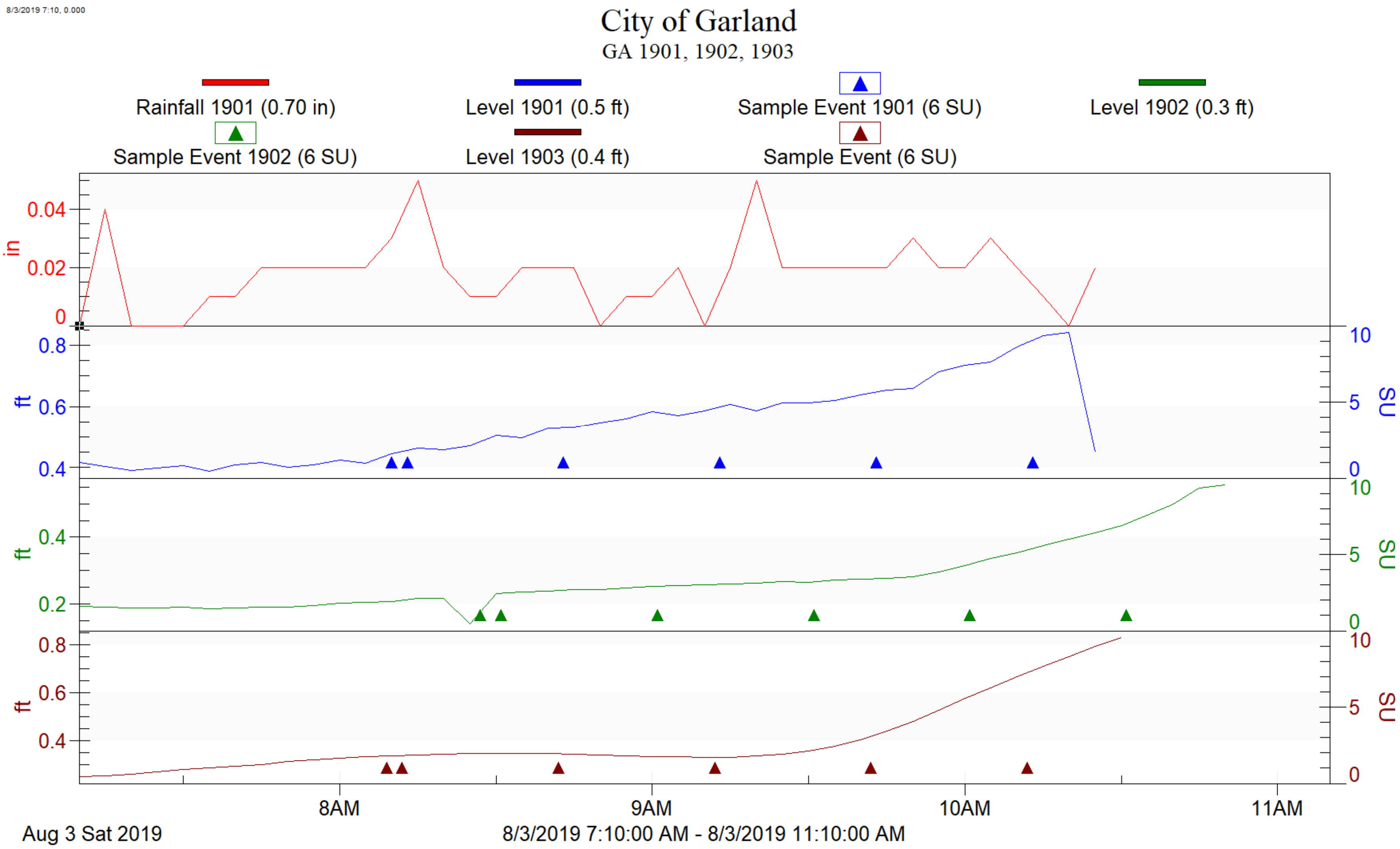
GA 1903

Station location description:	Duck Creek under La Prada Bridge		
Flow start time and date:	0710 08/03/19		
Flow end time and date:	1030 08/03/19		
Time first aliquot collected:	0810 08/03/19		
Time last aliquot collected:	1013 08/03/19		
Peak depth:	0.8 ft	Aliquots collected:	6
Average depth:	0.4 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, peak depth, and average depth are a result of the sampling equipment being removed at the conclusion of the sampling activities.

Prepared By: Adam Gottlieb Date: August 7, 2019

Checked By: Kyle McKee Date: October 4, 2019


8/3/2019 7:10, 0.000
City of Garland
GA 1901, 1902, 1903
Rainfall 1901 (0.70 in)
Level 1901 (0.5 ft)
Sample Event 1901 (6 SU)
Level 1902 (0.3 ft)
Sample Event 1902 (6 SU)
Level 1903 (0.4 ft)
Sample Event (6 SU)
in
0.04
0.02
0
ft
0.8
0.6
0.4
SU
10
5
0
ft
0.4
0.2
SU
10
5
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ft
0.8
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SU
10
5
0
8AM
9AM
10AM
11AM
Aug 3 Sat 2019
8/3/2019 7:10:00 AM - 8/3/2019 11:10:00 AM

Analytical Results Summary
NCTCOG Regional Stormwater Monitoring Program
NCTCOG Project 100063022
CITY OF GARLAND 2019

Storm Event: 8/3/2019 Project Number: 100063022	GA 1901	GA 1902	GA 1903	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	644	304	592	mg/L
Total Suspended Solids (TSS)	56.8	46.6	19.6	mg/L
Biochemical Oxygen Demand (BOD)	7.12	7.3	5.53	mg/L
Chemical Oxygen Demand (COD)	49	54	53	mg/L
Total Nitrogen	1.47	1.27	19.4	mg/L
Nitrate N	0.87	0.67	19.4	mg/L
Ammonia N	0.1458	0.2111	0.0575	mg/L
Orthophosphate	< 0.03 U	< 0.03 U	2.54	mg/L
Phosphorus, Dissolved	0.100	0.088	3.00	mg/L
Phosphorus, Total	0.090	0.108	2.86	mg/L
Atrazine	< 0.010 U	< 0.010 U	< 0.010 U	µg/L
Arsenic, Total	< 0.004 U	< 0.004 U	< 0.004 U	mg/L
Chromium, Total	0.004 J	< 0.004 U	< 0.004 U	mg/L
Copper, Total	0.018	0.018	0.016	mg/L
Lead, Total	< 0.004 U	< 0.004 U	< 0.004 U	mg/L
Zinc, Total	0.090	0.055	0.029	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	< 1.12 U	< 1.11 U	< 1.11 U	mg/L
pH	7.7	8.1	7.2	su
Ambient Air Temperature (field)	77	80	80	°F
Water Temperature (field)	76.8	Unknown	81.6	°F
E. Coli	4000	5600	5600	CFU/100 mL
Specific Conductivity	588	509	963	µS/cm

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J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected
ND - Not Detected at or above adjusted reporting limit

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG STORMWATER QUALITY MONITORING PROJECT
NCTCOG PROJECT ID 100063022
City of Irving 2019

Sample Collection Report
Event Date: July 10, 2019

Storm Summary

Storm description: Heavy rain moving slowly from north to south.

Rain event start time and date: 1818 07/10/19 Rainfall total: 0.7 in
Rain event end time and date: 1953 07/10/19 Peak 1-hr rate: 0.69 in/hr

Rainfall station: DFW International Airport (KDFW)
Antecedent dry period: 408 hrs

Comments: Antecedent dry period determined from DFW International Airport (KDFW) from http://texmesonet.org/.

IR 1902A

Station location description: Delaware Creek @ Maple Street

Flow start time and date: 1929 07/10/19 Time first aliquot collected: 1929 07/10/19
Flow end time and date: Unknown Time last aliquot collected: 2134 07/10/19

Peak depth: 3.190 ft Aliquots collected: 6
Average depth: 0.948 ft Total sample volume: 3.5 gal

Comments: The battery clip became dislodged at approximately 0115 on 07/11/19. Due to the loss of power, an accurate flow end time could not be determined. Most of the hydrograph data and all of the sample event times were recorded properly.

IR 1901

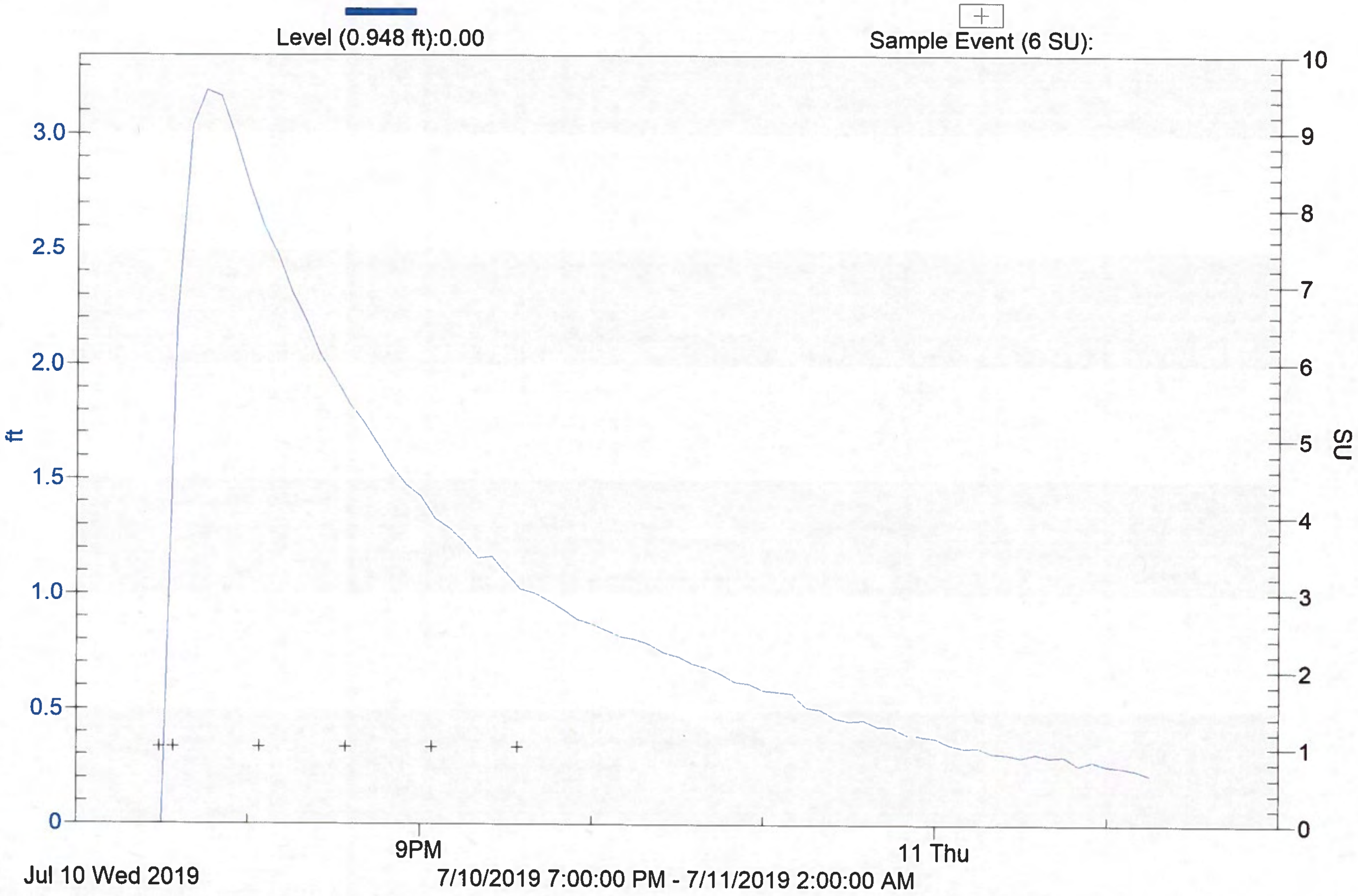
Station location description: Delaware Creek @ North Sowers Road

Comments: IR1901 sampler was in repair at the time of the rain event and no samples were collected.

Prepared By: Ryan Deal Date: 8/26/19
Checked By: Charles P Saddy Date: 8/27/19

Irving Delware Creek

IR1902A-3



Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

CITY OF IRVING 2019

Storm Event: 7/10/2019 Project Number: 100063022	**IR 1901**	**IR 1902A**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	N/A	419	mg/L
Total Suspended Solids (TSS)	N/A	119	mg/L
Biochemical Oxygen Demand (BOD)	N/A	< 2.0 ND	mg/L
Chemical Oxygen Demand (COD)	N/A	44.1	mg/L
Total Nitrogen	N/A	1.7	mg/L
Nitrate N	N/A	0.22	mg/L
Ammonia N	N/A	0.11	mg/L
Orthophosphate	N/A	< 0.040 ND	mg/L
Phosphorus, Dissolved	N/A	< 0.100 U	mg/L
Phosphorus, Total	N/A	0.16	mg/L
Atrazine	N/A	0.111	µg/L
Arsenic, Total	N/A	0.00422	mg/L
Chromium, Total	N/A	0.0188	mg/L
Copper, Total	N/A	0.00506	mg/L
Lead, Total	N/A	0.00702	mg/L
Zinc, Total	N/A	0.0351	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	N/A	< 4.9 ND	mg/L
pH	N/A	8.4	su
Ambient Air Temperature (field)	N/A	73	°F
Water Temperature (field)	N/A	85.9	°F
E. Coli	N/A	2755	MPN/100 mL
Specific Conductivity	N/A	563	µS/cm

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"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected
ND - Not Detected at or above adjusted reporting limit

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG STORMWATER QUALITY MONITORING PROJECT
NCTCOG PROJECT ID 100063022
City of Irving 2019

Sample Collection Report
Event Date: August 3, 2019

Storm Summary

Storm description: Moderate rain moving from northwest to southeast.

Rain event start time and date: 0830 08/03/19 Rainfall total: 0.2 in
Rain event end time and date: 1005 08/03/19 Peak 1-hr rate: 0.18 in/hr

Rainfall station:	DFW International Airport (KDFW)
Antecedent dry period:	564 hrs

Comments: Antecedent dry period determined from DFW International Airport (KDFW) from http://texmesonet.org/.

IR 1901

Station location description: Delaware Creek @ North Sowers Road

Flow start time and date: 0925 08/03/19 Time first aliquot collected: 0952 08/03/19
Flow end time and date: 0755 08/05/19 Time last aliquot collected: 1157 08/03/19

Peak depth:	0.43 ft	Aliquots collected:	6
Average depth:	0.15 ft	Total sample volume:	3.5 gal

Comments: Upon arrival at the sampler for data retrieval the bubbler line was dislodged from sampler pipe in the stream. However, stream level data was downloaded completely and a hydrograph was developed.

IR 1902A

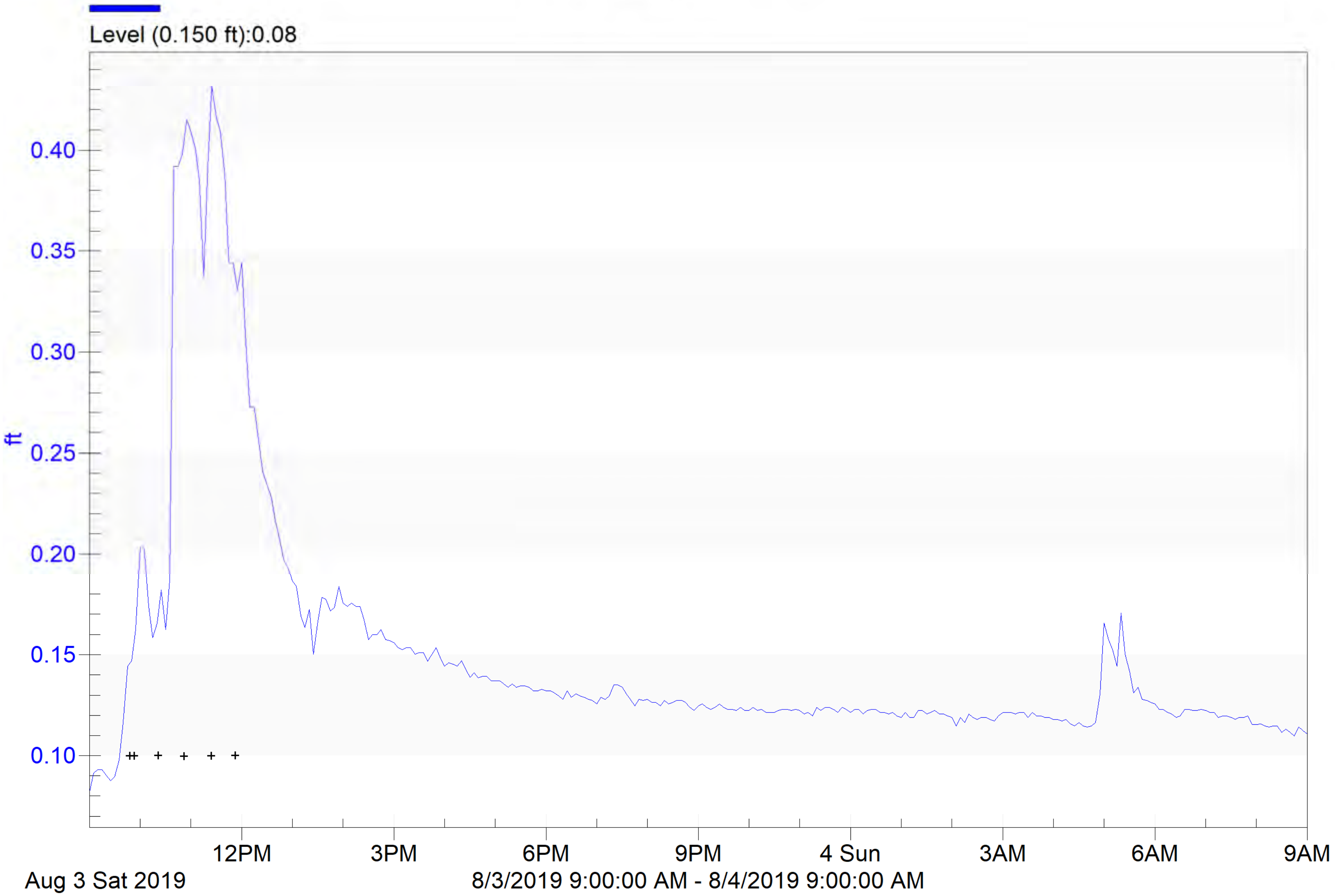
Station location description: Delaware Creek @ Maple Street

Comments: IR1902A sample was collected on July 10, 2019; therefore, no samples were collected at this site on August 3, 2019.

Prepared By: Ryan Deal Date: 8/26/19
Checked By: Charles P Saddy Date: 8/27/19

Irving Delaware Creek

IR1901-3



Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

CITY OF IRVING 2019

Storm Event: 8/3/2019 Project Number: 100063022	**IR 1901**	**IR 1902A**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	452	N/A	mg/L
Total Suspended Solids (TSS)	396.8	N/A	mg/L
Biochemical Oxygen Demand (BOD)	21.8	N/A	mg/L
Chemical Oxygen Demand (COD)	211	N/A	mg/L
Total Nitrogen	2.12	N/A	mg/L
Nitrate N	0.12	N/A	mg/L
Ammonia N	0.1665	N/A	mg/L
Orthophosphate	< 0.03 U	N/A	mg/L
Phosphorus, Dissolved	0.070	N/A	mg/L
Phosphorus, Total	0.607	N/A	mg/L
Atrazine	< 0.010 U	N/A	µg/L
Arsenic, Total	0.007 J	N/A	mg/L
Chromium, Total	0.034	N/A	mg/L
Copper, Total	0.051	N/A	mg/L
Lead, Total	0.017	N/A	mg/L
Zinc, Total	0.225	N/A	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	2.13 J	N/A	mg/L
pH	8.1	N/A	su
Ambient Air Temperature (field)	76	N/A	°F
Water Temperature (field)	81.8	N/A	°F
E. Coli	11200	N/A	CFU/100 mL
Specific Conductivity	326	N/A	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected
ND - Not Detected at or above adjusted reporting limit

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG REGIONAL STORMWATER MONITORING PROGRAM
PROJECT ID 100063022
CITY OF MESQUITE

Sample Collection Report
Event Date: August 3, 2019

Storm Summary

Storm description: A large storm system covered the entire DFW area while moving southeast across the metroplex.

Rain event start time and date:	0905 08/03/19	Rainfall total:	0.16 in
Rain event end time and date:	1145 08/03/19	Peak 1-hr rate:	0.12 in/hr

Rainfall station:	MS 1902
Antecedent dry period:	830 hrs

Comments: The antecedent dry period was calculated using a combination of data from the KTXMESQU27 weather station located at the Municipal Center (www.wunderground.com/weatherstation) and MS 1902.

MS 1901

Station location description: North of New Market Road

Flow start time and date:	1035 08/03/19
Flow end time and date:	1330 08/03/19

Time first aliquot collected:	1042 08/03/19
Time last aliquot collected:	1245 08/03/19

Peak depth:	3.3 ft	Aliquots collected:	6
Average depth:	2.1 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, peak depth, and average depth are a result of the sampling equipment being removed at the conclusion of the sampling activities.

MS 1902

Station location description: North Mesquite Creek at Edward’s Church

Flow start time and date: 0950 08/03/19
Flow end time and date: 1305 08/03/19

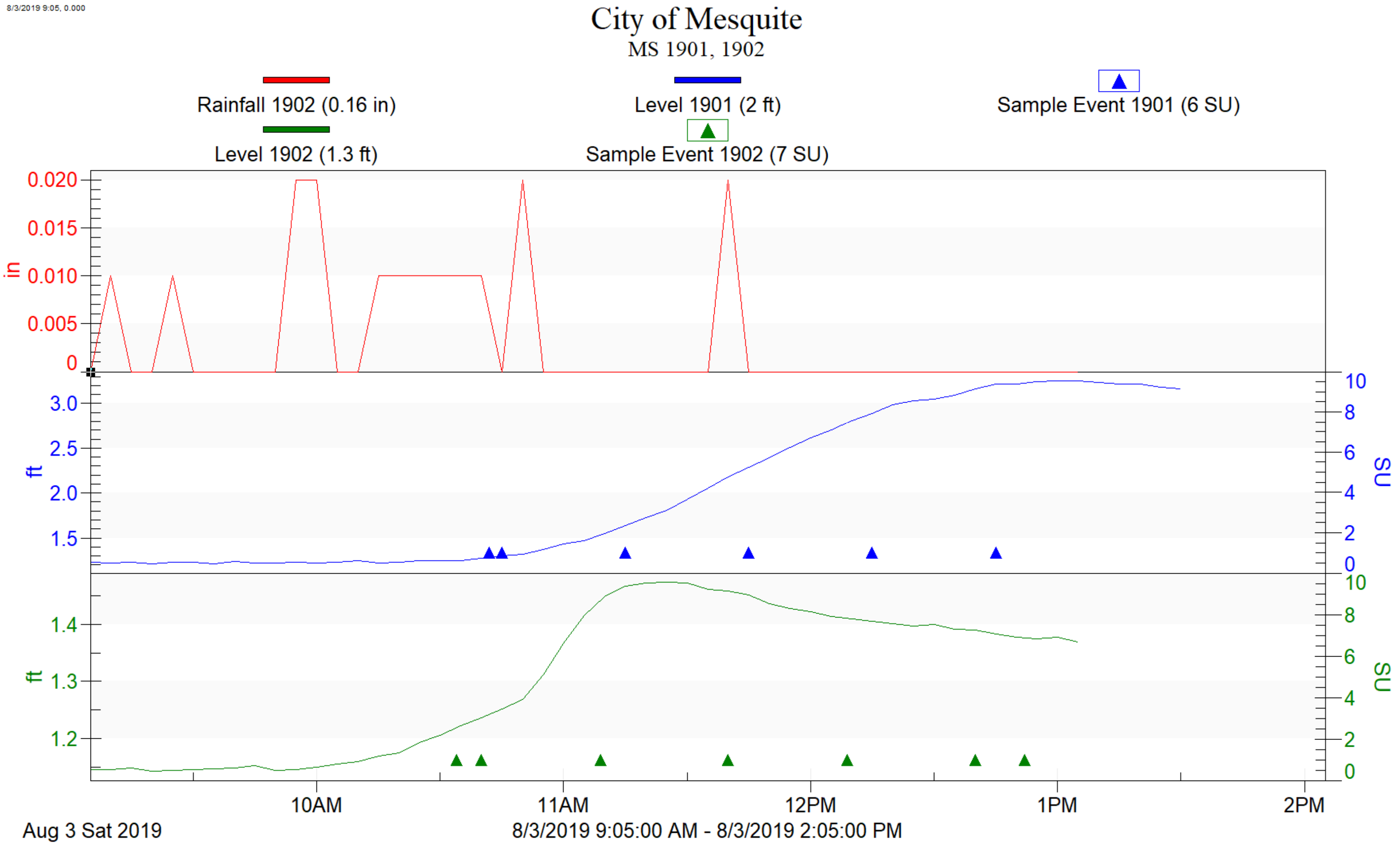
Time first aliquot collected: 1034 08/03/19
Time last aliquot collected: 1252 08/03/19

Peak depth:	1.5 ft	Aliquots collected:	6
Average depth:	1.3 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date are a result of the sampling equipment being removed at the conclusion of the sampling activities. Second aliquot from the right represents an unsuccessful sample due to an insufficient battery. As a result, the sample was manually taken.

Prepared By: Adam Gottlieb Date: August 7, 2019

Checked By: Kyle McKee Date: October 4, 2019


8/3/2019 9:05, 0.000
City of Mesquite
MS 1901, 1902
Rainfall 1902 (0.16 in)
Level 1901 (2 ft)
Sample Event 1901 (6 SU)
Level 1902 (1.3 ft)
Sample Event 1902 (7 SU)
in
0.020
0.015
0.010
0.005
0
ft
3.0
2.5
2.0
1.5
SU
10
8
6
4
2
0
ft
1.4
1.3
1.2
SU
10
8
6
4
2
0
10AM
11AM
12PM
1PM
2PM
Aug 3 Sat 2019
8/3/2019 9:05:00 AM - 8/3/2019 2:05:00 PM

Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

CITY OF MESQUITE 2019

Storm Event: 8/3/2019 Project Number: 100063022	**MS 1901**	**MS 1902**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	506	380	mg/L
Total Suspended Solids (TSS)	65.2	17.8	mg/L
Biochemical Oxygen Demand (BOD)	3.43	2.38	mg/L
Chemical Oxygen Demand (COD)	39	20	mg/L
Total Nitrogen	0.64	0.75	mg/L
Nitrate N	0.18	0.27	mg/L
Ammonia N	0.069 J	0.0602 J	mg/L
Orthophosphate	< 0.03 U	< 0.03 U	mg/L
Phosphorus, Dissolved	0.075	0.060	mg/L
Phosphorus, Total	0.080	0.060	mg/L
Atrazine	< 0.010 U	< 0.010 U	µg/L
Arsenic, Total	< 0.004 U	< 0.004 U	mg/L
Chromium, Total	0.006 J	< 0.004 U	mg/L
Copper, Total	0.014	< 0.01 U	mg/L
Lead, Total	0.005 J	< 0.004 U	mg/L
Zinc, Total	0.026	0.017	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	< 1.11 U	1.56 J	mg/L
pH	8.02	7.88	su
Ambient Air Temperature (field)	81	81	°F
Water Temperature (field)	80.0	79.6	°F
E. Coli	4600	1200	CFU/100 mL
Specific Conductivity	792	681	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected
ND - Not Detected at or above adjusted reporting limit

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG REGIONAL STORMWATER MONITORING PROGRAM
PROJECT ID 100063022
NORTH TEXAS TOLLWAY AUTHORITY

Sample Collection Report
Event Date: August 3, 2019

Storm Summary

Storm description: A large storm system covered the entire DFW area while moving southeast across the metroplex.

Rain event start time and date:	0750 08/03/19	Rainfall total:	0.13 in
Rain event end time and date:	1020 08/03/19	Peak 1-hr rate:	0.11 in/hr

Rainfall station:	NTTA 1901
Antecedent dry period:	564 hrs

Comments: The antecedent dry period was calculated using data from NTTA 1901 and the GPTX 6080 weather station located at N Cottonwood and Great Southwest Parkway (https://gptx.onerain.com/home.php).

NTTA 1901

Station location description: Unnamed Tributary at SH 161 N. of Gateway Dr.

Flow start time and date:	0925 08/03/19
Flow end time and date:	1150 08/03/19
Time first aliquot collected:	0935 08/03/19
Time last aliquot collected:	1139 08/03/19

Peak depth:	1.4 ft	Aliquots collected:	6
Average depth:	0.8 ft	Total sample volume:	3.5 gal

Comments: Flow end time and date, and average depth are the result of the sampling equipment being removed at the conclusion of the sampling activities.

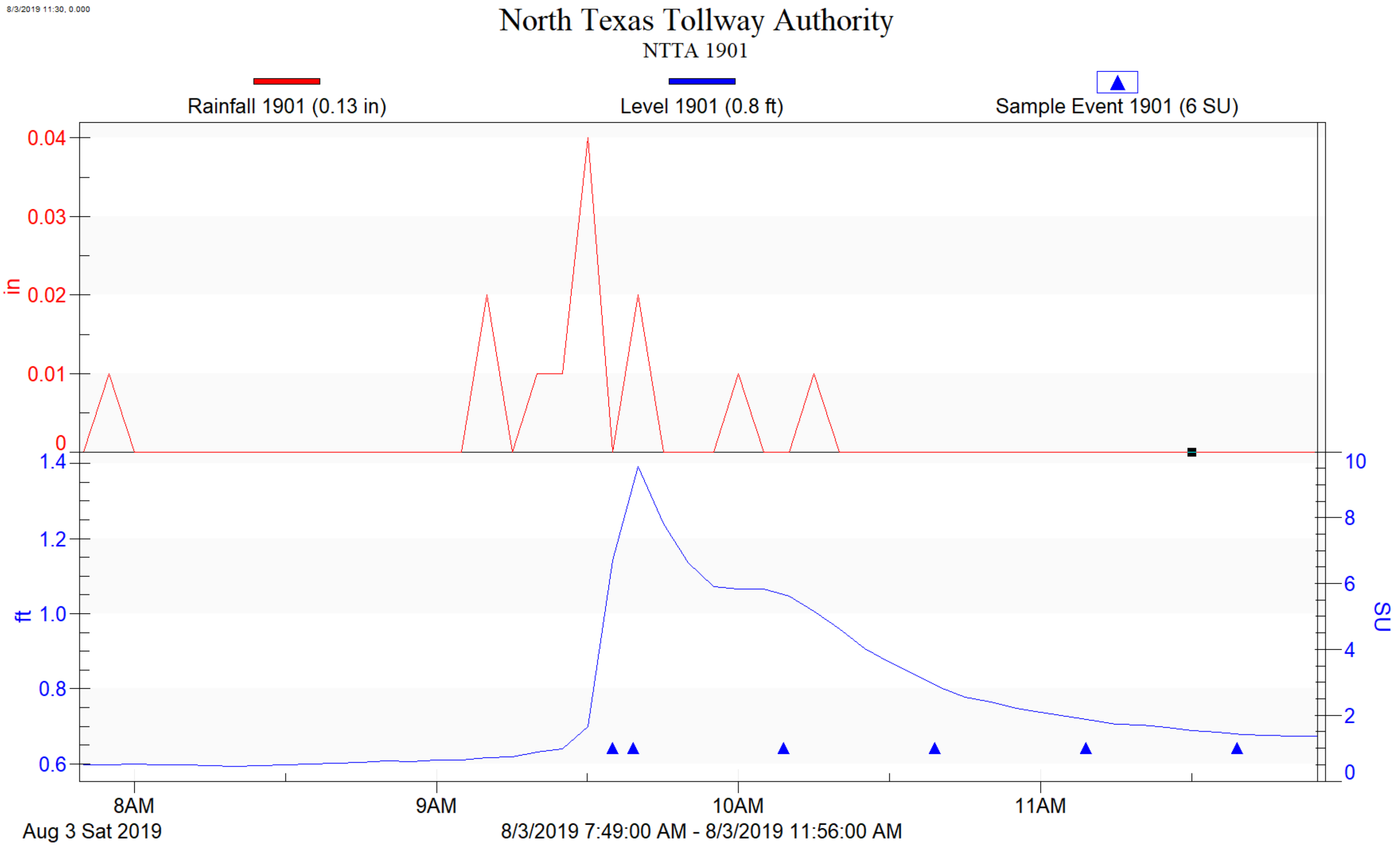
NTTA 1902

Station location description: Cottonwood Creek at SH 161 S. of Dickey Road

Comments: Samples were successfully collected on July 10, 2019.

Prepared By: Adam Gottlieb Date: August 7, 2019

Checked By: Kyle McKee Date: October 4, 2019


8/3/2019 11:30, 0.000
North Texas Tollway Authority
NTTA 1901
Rainfall 1901 (0.13 in)
Level 1901 (0.8 ft)
Sample Event 1901 (6 SU)
0.04
0.03
0.02
0.01
0
in
1.4
1.2
1.0
0.8
0.6
ft
10
8
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2
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SU
8AM
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11AM
Aug 3 Sat 2019
8/3/2019 7:49:00 AM - 8/3/2019 11:56:00 AM

Analytical Results Summary
NCTCOG Regional Stormwater Monitoring Program
NCTCOG Project 100063022

NORTH TEXAS TOLLWAY AUTHORITY 2019

Storm Event: 8/3/2019 Project Number: 100063022	**NTTA 1901**	**NTTA 1902**	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	172	N/A	mg/L
Total Suspended Solids (TSS)	13.2	N/A	mg/L
Biochemical Oxygen Demand (BOD)	7.69	N/A	mg/L
Chemical Oxygen Demand (COD)	85	N/A	mg/L
Total Nitrogen	5.50	N/A	mg/L
Nitrate N	1.19	N/A	mg/L
Ammonia N	1.16	N/A	mg/L
Orthophosphate	< 0.03 U	N/A	mg/L
Phosphorus, Dissolved	0.185	N/A	mg/L
Phosphorus, Total	0.205	N/A	mg/L
Atrazine	< 0.010 U	N/A	µg/L
Arsenic, Total	< 0.004 U	N/A	mg/L
Chromium, Total	0.004 J	N/A	mg/L
Copper, Total	0.012	N/A	mg/L
Lead, Total	< 0.004 U	N/A	mg/L
Zinc, Total	0.05	N/A	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	< 1.11 U	N/A	mg/L
pH	8.2	N/A	su
Ambient Air Temperature (field)	78	N/A	°F
Water Temperature (field)	80.4	N/A	°F
E. Coli	5200	N/A	CFU/100 mL
Specific Conductivity	391	N/A	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected
ND - Not Detected at or above adjusted reporting limit

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG REGIONAL STORMWATER MONITORING PROGRAM
PROJECT ID 100063022
NORTH TEXAS TOLLWAY AUTHORITY

Sample Collection Report
Event Date: July 10, 2019

Storm Summary

Storm description: Moderate rain formed north of the metroplex and moved south across the metroplex.

Rain event start time and date:	1716 07/10/19	Rainfall total:	0.95 in
Rain event end time and date:	1923 07/10/19	Peak 1-hr rate:	0.80 in/hr

Rainfall station:	GPTX 6080
Antecedent dry period:	94 hrs

Comments: The NTTA 1901 rain gauge was clogged during the rain event. As a result, the storm summary was calculated using data from the GPTX 6080 weather station located at N Cottonwood and Great Southwest Parkway (https://gptx.onerain.com/home.php).

NTTA 1901

Station location description: Unnamed Tributary at SH 161 N. of Gateway Dr.

Comments: The automatic sampler did not initiate sample collection due to a clogged rain gauge.

NTTA 1902

Station location description: Cottonwood Creek at SH 161 S. of Dickey Road

Flow start time and date: 1840 07/10/19
Flow end time and date: 0945 07/12/19

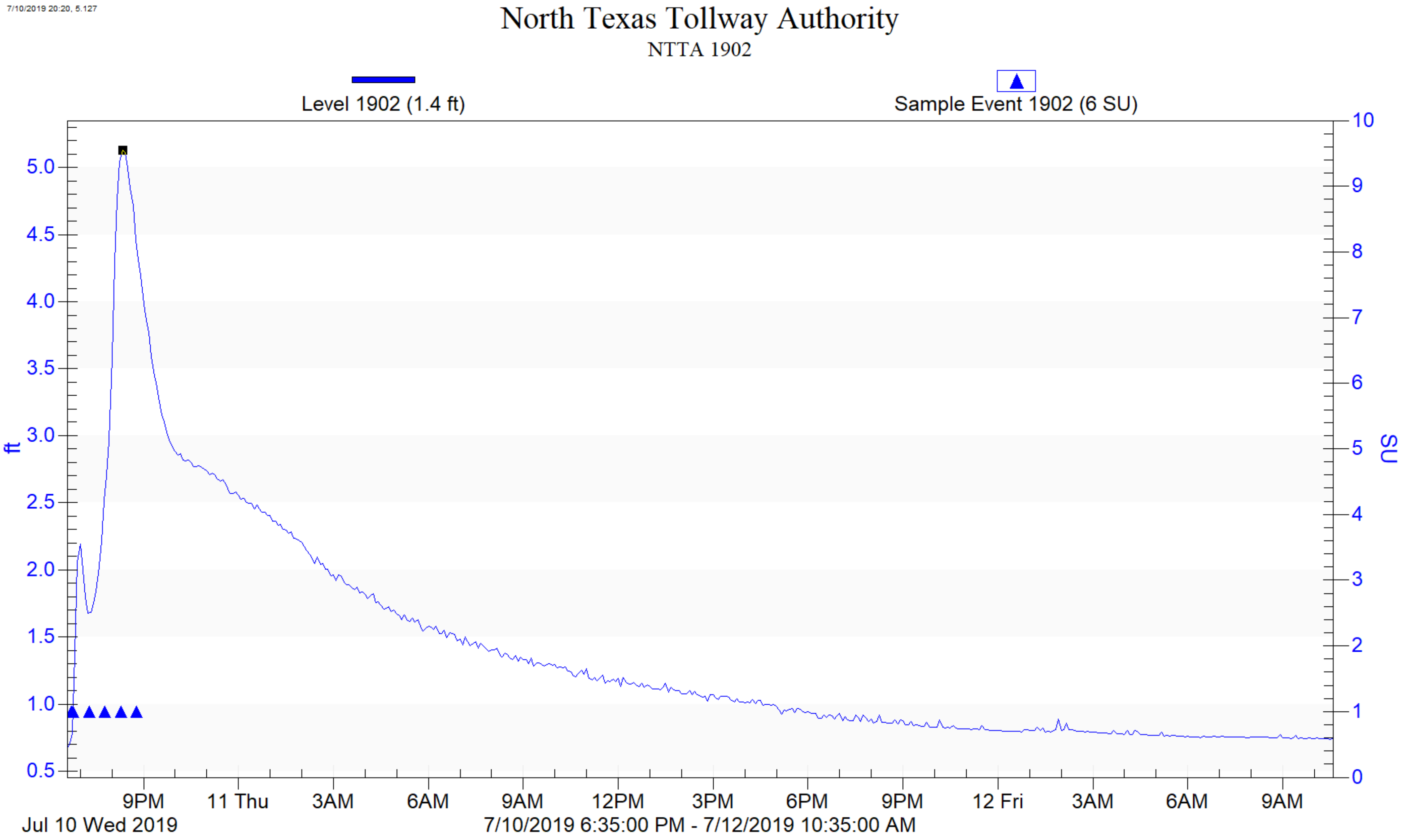
Time first aliquot collected: 1843 07/10/19
Time last aliquot collected: 2047 07/10/19

Peak depth:	5.1 ft	Aliquots collected:	6
Average depth:	1.4 ft	Total sample volume:	3.5 gal

Comments: None.

Prepared By: Adam Gottlieb Date: July 23, 2019

Checked By: Kyle McKee Date: October 4, 2019


7/10/2019 20:20, 5.127
North Texas Tollway Authority
NTTA 1902
Level 1902 (1.4 ft)
Sample Event 1902 (6 SU)
ft
SU
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
10
9
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6AM
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12PM
3PM
6PM
9PM
12 Fri
3AM
6AM
9AM
Jul 10 Wed 2019
7/10/2019 6:35:00 PM - 7/12/2019 10:35:00 AM

Analytical Results Summary

NCTCOG Regional Stormwater Monitoring Program

NCTCOG Project 100063022

NORTH TEXAS TOLLWAY AUTHORITY 2019

Storm Event: 7/10/2019 Project Number: 100063022	NTTA 1901	NTTA 1902	
PARAMETER NAME	**COMPOSITE**	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	N/A	159	mg/L
Total Suspended Solids (TSS)	N/A	60.9	mg/L
Biochemical Oxygen Demand (BOD)	N/A	6.4	mg/L
Chemical Oxygen Demand (COD)	N/A	< 35.0 ND	mg/L
Total Nitrogen	N/A	1.7	mg/L
Nitrate N	N/A	0.28	mg/L
Ammonia N	N/A	0.12	mg/L
Orthophosphate	N/A	< 0.040 ND	mg/L
Phosphorus, Dissolved	N/A	< 0.100 U	mg/L
Phosphorus, Total	N/A	0.25	mg/L
Atrazine	N/A	0.052 J	µg/L
Arsenic, Total	N/A	0.00582	mg/L
Chromium, Total	N/A	0.0146	mg/L
Copper, Total	N/A	0.00744	mg/L
Lead, Total	N/A	0.00589	mg/L
Zinc, Total	N/A	0.0451	mg/L
PARAMETER NAME	**GRAB**	**GRAB**	**UNIT**
Oil & Grease(HEM)	N/A	< 5.3 ND	mg/L
pH	N/A	8.1	su
Ambient Air Temperature (field)	N/A	74	°F
Water Temperature (field)	N/A	84.2	°F
E. Coli	N/A	4352	MPN/100 mL
Specific Conductivity	N/A	220	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected
ND - Not Detected at or above adjusted reporting limit

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS
NCTCOG REGIONAL STORMWATER MONITORING PROGRAM
PROJECT ID 100063022
CITY OF PLANO

Sample Collection Report
Event Date: August 3, 2019

Storm Summary

Storm description: A large storm system covered the entire DFW area while moving southeast across the metroplex.

Rain event start time and date: 0610 08/03/19 Rainfall total: 0.32 in
Rain event end time and date: 0950 08/03/19 Peak 1-hr rate: 0.13 in/hr

Rainfall station: PL 1901
Antecedent dry period: 828 hrs

Comments: The antecedent dry period was calculated using a combination of data from the weather station KTXPLANO394 located in North Dallas Estates (www.wunderground.com/weatherstation) and PL 1901.

PL 1901

Station location description: Spring Creek at 16th Street

Flow start time and date: 0725 08/03/19
Flow end time and date: 0950 08/03/19

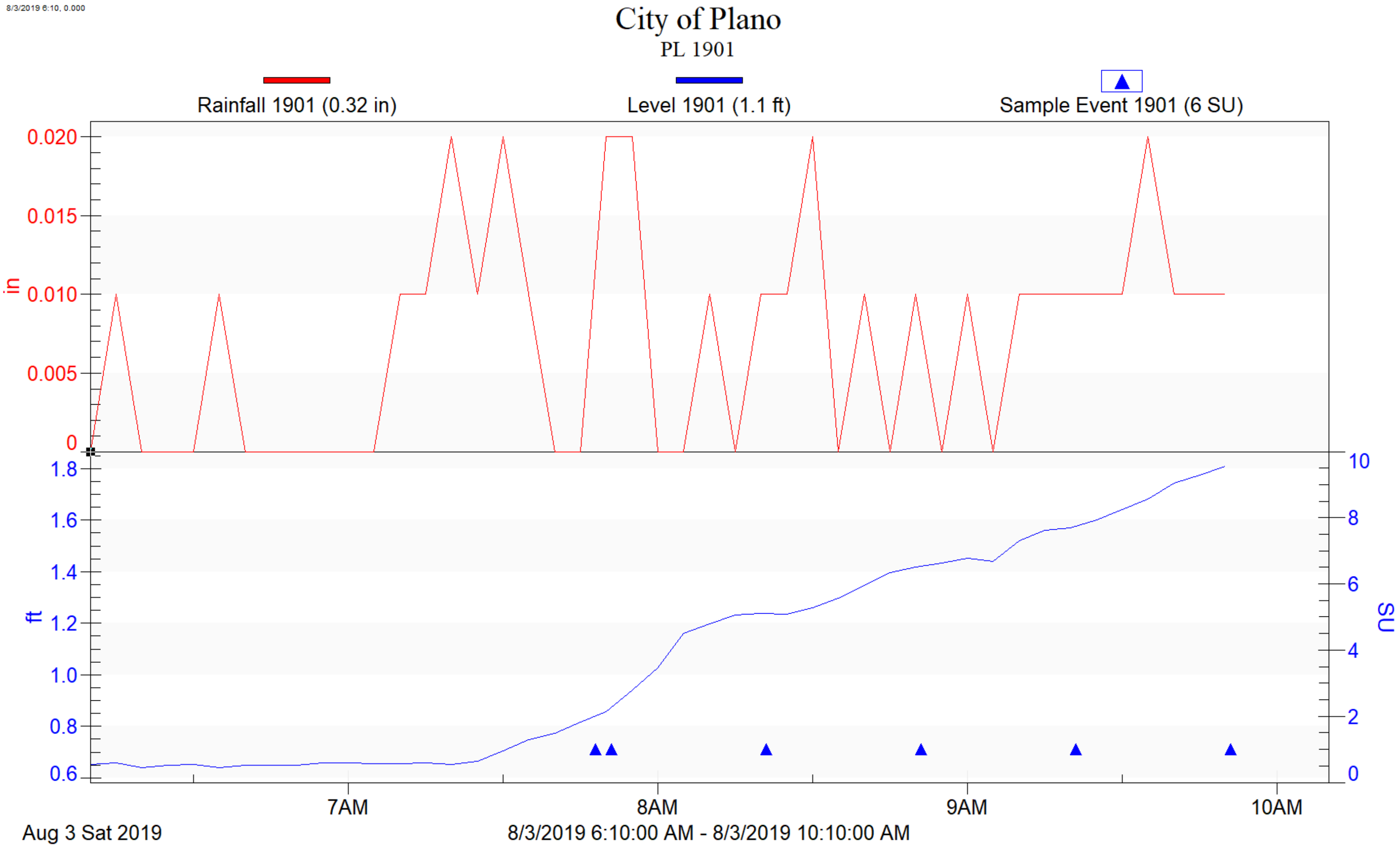
Time first aliquot collected: 0748 08/03/19
Time last aliquot collected: 0951 08/03/19

Peak depth: 1.8 ft Aliquots collected: 6
Average depth: 1.1 ft Total sample volume: 3.5 gal

Comments: Flow end time and date, and average depth are the result of the sampling equipment being removed at the conclusion of the sampling activities.

Prepared By: Adam Gottlieb Date: August 7, 2019

Checked By: Kyle McKee Date: October 4, 2019


8/3/2019 6:10, 0.000
City of Plano
PL 1901
Rainfall 1901 (0.32 in)
Level 1901 (1.1 ft)
Sample Event 1901 (6 SU)
in
0.020
0.015
0.010
0.005
0
ft
1.8
1.6
1.4
1.2
1.0
0.8
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Aug 3 Sat 2019
8/3/2019 6:10:00 AM - 8/3/2019 10:10:00 AM

Analytical Results Summary
NCTCOG Regional Stormwater Monitoring Program
NCTCOG Project 100063022

CITY OF PLANO 2019

Storm Event: 8/3/2019 Project Number: 100063022	**PL 1901**	
PARAMETER NAME	**COMPOSITE**	**UNIT**
Total Dissolved Solids (TDS)	222	mg/L
Total Suspended Solids (TSS)	130.2	mg/L
Biochemical Oxygen Demand (BOD)	17.1	mg/L
Chemical Oxygen Demand (COD)	90	mg/L
Total Nitrogen	0.67	mg/L
Nitrate N	0.68	mg/L
Ammonia N	0.0602 J	mg/L
Orthophosphate	< 0.03 U	mg/L
Phosphorus, Dissolved	0.061	mg/L
Phosphorus, Total	0.244	mg/L
Atrazine	< 0.010 U	µg/L
Arsenic, Total	< 0.005 U	mg/L
Chromium, Total	0.005 J	mg/L
Copper, Total	0.037	mg/L
Lead, Total	0.004 J	mg/L
Zinc, Total	0.144	mg/L
PARAMETER NAME	**GRAB**	**UNIT**
Oil & Grease(HEM)	3.03	mg/L
pH	8.0	su
Ambient Air Temperature (field)	77	°F
Water Temperature (field)	79.9	°F
E. Coli	4000	CFU/100 mL
Specific Conductivity	521	µS/cm

">" - Not Identified Above the Upper Detection Limit
"<" - Not Identified Below the Lower Detection Limit
J - Positively Identified Below the Lower Detection Limit
NST - No Sample Taken
U - Undetected
ND - Not Detected at or above adjusted reporting limit

Appendix H:

Dallas Bioassessment Report

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Table B-2 Reference Sites Used for Rapid Bioassessment Program

	Site	Reference Site
Bachman Branch – Elm Fork Trinity River	BAB-B – Bachman Branch site B	SMCA - South Mesquite Creek site A
White Rock Creek – White Rock Lake	DIX-A – Dixon Branch site A	SMCA - South Mesquite Creek site A
Five Mile Creek – Trinity River	FIV-A – Five Mile Creek site A	SMCA - South Mesquite Creek site A
Headwaters Turtle Creek	KNI-A – Knights Branch site A	SMCA - South Mesquite Creek site A

Table B-3c Rapid Bioassessment Protocol – Habitat Assessment Data 1

HUC Watershed	Sample ID	Collection Date	Habitat Score	Average Stream Depth (meters)	Average Stream Width (meters)	Channel Alteration	Channel Sinuosity	Embeddedness
Bachman Branch - Elm Fork Trinity River	JOES-1	4/3/2019	136	Unwadable		12	7	5
		8/1/2019	141	0.37	8.23	12	12	10
	BAB-B	3/18/2019	167	0.20	12.50	15	13	18
		7/16/2019	140	0.32	3.96	9	8	11
	NWDA-1	4/3/2019	137	0.32	16.15	16	5	10
		8/1/2019	118	0.36	10.36	11	5	11
	RIB-A	4/11/2019	147	0.30	3.66	15	8	10
		7/18/2019	111	0.24	2.74	8	8	5
Delaware Creek - West Fork Trinity River	MOC-A	3/20/2019	165	0.14	8.23	12	10	14
		7/10/2019	131	0.37	11.58	7	11	6
Farmer's Branch - Elm Fork Trinity River	FARM-1	4/3/2019	167	0.16	8.23	16	6	13
		8/1/2019	149	0.28	7.01	15	8	10
Five Mile Creek – Trinity River	FIV-A	3/19/2019	Creek too deep to collect macroinvertebrate samples and conduct habitat assessment					
		7/15/2019	Creek too deep to collect macroinvertebrate samples and conduct habitat assessment					
	FIV-B	3/19/2019	131	0.59	14.63	11	9	13
		7/15/2019	126	0.59	10.67	14	8	6
	NEW-A	3/20/2019	135	0.46	6.40	9	8	5
		7/10/2019	153	0.37	8.23	13	6	13
	SEDA-1	4/3/2019	128	0.25	3.51	8	6	10
		8/1/2019	117	0.13	2.44	5	10	10
Floyd Branch - White Rock Creek	FLO-A	3/21/2019	172	0.14	7.32	15	10	11
		7/8/2019	112	0.20	6.40	7	9	11
	MCK-C	3/18/2019	111	0.12	3.05	11	14	10
		7/16/2019	118	0.15	3.35	5	8	9

Table B-3c (continued) Rapid Bioassessment Protocol – Habitat Assessment Data 1

HUC Watershed	Sample ID	Collection Date	Habitat Score	Average Stream Depth (meters)	Average Stream Width (meters)	Channel Alteration	Channel Sinuosity	Embeddedness
Headwaters Five Mile Creek	FIV-D	3/21/2019	178	0.15	7.92	15	10	11
		7/8/2019	167	0.1	4.57	8	13	9
Headwaters Ten Mile Creek	TEN-B	3/20/2019	184	0.26	10.51	16	10	12
		7/10/2019	150	0.26	15.54	13	10	9
	TEN-D	3/21/2019	176	0.24	15.54	12	9	11
		7/8/2019	136	0.08	6.10	13	8	8
Headwaters Turtle Creek	CEB-B	3/18/2019	112	0.26	3.05	6	12	13
		7/15/2019	86	0.16	3.66	5	8	5
	KNI-A	3/18/2019	141	0.27	14.63	8	10	14
		7/15/2019	137	0.13	11.58	9	14	14
	TRO-A	4/2/2019	136	0.19	3.96	7	7	10
		7/18/2019	125	0.28	10.67	12	11	5
	TUR-A	4/11/2019	137	0.38	4.27	11	8	8
		7/18/2019	112	0.41	2.89	7	7	9
Prairie Creek - Trinity River	PRA-A	3/20/2019	156	0.23	7.32	13	9	13
		7/10/2019	157	0.44	9.75	13	8	13
South Mesquite Creek	SMC-A	3/19/2019	129	0.19	11.28	12	13	16
		7/16/2019	150	0.14	0.91	11	10	15
	SMC-B	4/2/2019	150	0.21	4.57	10	10	10
		7/18/2010	127	0.25	5.18	13	16	5
	SMC-C	4/11/2019	130	0.28	7.32	13	10	10
		7/18/2019	142	0.15	6.40	12	11	8
Turtle Creek - Trinity River	CEDR-1	4/3/2019	143	0.15	13.11	13	9	10
		8/1/2019	125	0.23	4.27	12	12	6
	COO-A	4/2/2019	156	0.20	6.10	11	8	13
		7/18/2019	133	0.18	3.35	7	10	11
White Rock Creek - White Rock Lake	DIX-A	3/19/2019	135	0.33	3.96	18	14	12
		7/16/2019	134	0.43	4.57	13	12	8

Table B-3c (continued) Rapid Bioassessment Protocol – Habitat Assessment Data 1

HUC Watershed	Sample ID	Collection Date	Epifaunal Substrate / Available Cover	Frequency of Riffles	Left Bank Stability	Left Bank Vegetative Protection	Pool Substrate Characterization	Pool Variability	Channel Flow Status
Bachman Branch - Elm Fork Trinity River	JOES-1	4/3/2019	6	5	6	5	11	13	18
		8/1/2019	10	6	6	3	10	15	15
	BAB-B	3/18/2019	10	16	9	7	13	8	8
		7/16/2019	7	8	9	9	9	8	9
	NWDA-1	4/3/2019	11	5	6	6	12	12	12
		8/1/2019	11	11	5	3	7	8	7
	RIB-A	4/11/2019	11	11	6	5	13	13	11
		7/18/2019	9	13	7	5	11	6	5
Delaware Creek - West Fork Trinity River	MOC-A	3/20/2019	10	16	6	6	12	14	9
		7/10/2019	9	11	8	2	6	10	14
Farmer's Branch - Elm Fork Trinity River	FARM-1	4/3/2019	13	5	8	5	13	16	12
		8/1/2019	12	10	6	6	13	14	14
Five Mile Creek – Trinity River	FIV-A	3/19/2019	Creek too deep to collect macroinvertebrate samples and conduct habitat assessment						
		7/15/2019	Creek too deep to collect macroinvertebrate samples and conduct habitat assessment						
	FIV-B	3/19/2019	9	6	1	4	3	11	12
		7/15/2019	7	3	6	3	5	14	13
	NEW-A	3/20/2019	8	10	2	4	8	16	13
		7/10/2019	8	8	4	8	10	8	18
	SEDA-1	4/3/2019	10	12	5	3	11	11	10
		8/1/2019	8	11	4	3	7	6	12
Floyd Branch - White Rock Creek	FLO-A	3/21/2019	15	16	6	8	15	14	11
		7/8/2019	7	5	3	2	8	8	14
	MCK-C	3/18/2019	12	12	4	3	6	8	6
		7/16/2019	8	9	9	9	8	5	9

Table B-3c (continued) Rapid Bioassessment Protocol – Habitat Assessment Data 1

HUC Watershed	Sample ID	Collection Date	Epifaunal Substrate / Available Cover	Frequency of Riffles	Left Bank Stability	Left Bank Vegetative Protection	Pool Substrate Characterization	Pool Variability	Channel Flow Status
Headwaters Five Mile Creek	FIV-D	3/21/2019	17	15	7	9	12	14	13
		7/8/2019	20	3	9	9	13	18	8
Headwaters Ten Mile Creek	TEN-B	3/20/2019	11	17	2	8	11	13	13
		7/10/2019	11	10	4	4	11	12	15
	TEN-D	3/21/2019	10	16	8	9	12	10	18
		7/8/2019	13	13	7	4	8	13	8
Headwaters Turtle Creek	CEB-B	3/18/2019	8	3	3	4	10	7	9
		7/15/2019	9	4	2	4	5	5	9
	KNI-A	3/18/2019	13	3	8	7	10	12	13
		7/15/2019	8	8	9	2	5	16	13
	TRO-A	4/2/2019	8	11	5	4	11	12	13
		7/18/2019	7	11	5	9	11	6	8
	TUR-A	4/11/2019	8	11	6	6	11	11	13
		7/18/2019	12	8	5	5	11	9	7
Prairie Creek - Trinity River	PRA-A	3/20/2019	12	15	5	5	11	10	12
		7/10/2019	13	8	8	8	5	8	11
South Mesquite Creek	SMC-A	3/19/2019	10	10	2	3	13	7	8
		7/16/2019	12	12	6	6	9	10	10
	SMC-B	4/2/2019	10	11	9	6	12	15	18
		7/18/2010	11	3	2	2	8	10	16
	SMC-C	4/11/2019	10	10	5	6	11	9	11
		7/18/2019	10	7	6	8	8	11	12
Turtle Creek - Trinity River	CEDR-1	4/3/2019	10	15	5	5	11	11	10
		8/1/2019	8	11	5	3	7	10	8
	COO-A	4/2/2019	12	14	6	7	13	10	11
		7/18/2019	6	11	7	4	8	10	9
White Rock Creek - White Rock Lake	DIX-A	3/19/2019	10	9	2	2	12	10	6
		7/16/2019	12	4	5	3	12	14	12

Table B-3c (continued) Rapid Bioassessment Protocol – Habitat Assessment Data 1

HUC Watershed	Sample ID	Collection Date	Right Bank Stability	Right Bank Vegetative Protection	Riparian Vegetative Zone Width-Left	Riparian Vegetative Zone Width-Right	Sediment Deposition	Velocity / Depth Regime
Bachman Branch - Elm Fork Trinity River	JOES-1	4/3/2019	7	5	6	6	19	5
		8/1/2019	6	3	6	6	13	8
	BAB-B	3/18/2019	7	7	5	5	13	13
		7/16/2019	9	9	9	9	8	9
	NWDA-1	4/3/2019	6	6	2	3	15	10
		8/1/2019	6	3	4	5	10	11
	RIB-A	4/11/2019	6	6	6	5	11	10
		7/18/2019	7	5	4	4	7	7
Delaware Creek - West Fork Trinity River	MOC-A	3/20/2019	6	6	7	7	16	14
		7/10/2019	8	2	4	4	15	14
Farmer's Branch - Elm Fork Trinity River	FARM-1	4/3/2019	8	6	7	7	18	14
		8/1/2019	6	6	3	3	12	11
Five Mile Creek – Trinity River	FIV-A	3/19/2019	Creek too deep to collect macroinvertebrate samples and conduct habitat assessment					
		7/15/2019	Creek too deep to collect macroinvertebrate samples and conduct habitat assessment					
	FIV-B	3/19/2019	1	4	7	7	16	17
		7/15/2019	6	3	7	7	9	15
	NEW-A	3/20/2019	2	4	8	8	16	14
		7/10/2019	4	8	9	10	13	13
	SEDA-1	4/3/2019	5	5	4	4	11	13
		8/1/2019	4	3	5	5	13	11
Floyd Branch - White Rock Creek	FLO-A	3/21/2019	6	6	5	5	16	13
		7/8/2019	3	2	3	3	13	14
	MCK-C	3/18/2019	4	3	2	2	8	6
		7/16/2019	9	9	2	2	8	9

Table B-3c (continued) Rapid Bioassessment Protocol – Habitat Assessment Data 1

HUC Watershed	Sample ID	Collection Date	Right Bank Stability	Right Bank Vegetative Protection	Riparian Vegetative Zone Width-Left	Riparian Vegetative Zone Width-Right	Sediment Deposition	Velocity / Depth Regime
Headwaters Five Mile Creek	FIV-D	3/21/2019	8	8	5	5	15	14
		7/8/2019	9	9	9	9	8	13
Headwaters Ten Mile Creek	TEN-B	3/20/2019	3	8	8	8	11	14
		7/10/2019	5	4	8	8	12	14
	TEN-D	3/21/2019	8	7	7	5	18	16
		7/8/2019	7	4	7	7	8	8
Headwaters Turtle Creek	CEB-B	3/18/2019	3	4	5	6	10	9
		7/15/2019	2	4	5	5	9	5
	KNI-A	3/18/2019	8	7	2	5	13	8
		7/15/2019	9	2	6	6	8	8
	TRO-A	4/2/2019	6	5	4	4	16	13
		7/18/2019	5	9	7	7	5	7
	TUR-A	4/11/2019	6	6	6	5	11	10
		7/18/2019	5	5	4	4	7	7
Prairie Creek - Trinity River	PRA-A	3/20/2019	5	5	7	7	13	14
		7/10/2019	7	9	8	9	16	13
South Mesquite Creek	SMC-A	3/19/2019	2	3	3	3	12	12
		7/16/2019	6	6	6	6	12	13
	SMC-B	4/2/2019	6	3	3	3	18	6
		7/18/2010	7	6	4	4	12	8
	SMC-C	4/11/2019	5	5	6	6	7	6
		7/18/2019	6	8	5	5	11	14
Turtle Creek - Trinity River	CEDR-1	4/3/2019	6	5	5	5	10	13
		8/1/2019	5	3	7	7	10	11
	COO-A	4/2/2019	8	9	4	4	13	13
		7/18/2019	7	4	7	7	11	14
White Rock Creek - White Rock Lake	DIX-A	3/19/2019	2	5	5	5	11	12
		7/16/2019	5	3	6	6	11	8

Table B-4 Aquatic Life Use Rating Data

HUC Watershed	Sample ID	Spring 2018		Summer 2018	
Bachman Branch - Elm Fork Trinity River	JOES-1	-	unwadable	24	Intermediate
	BAB-B	27	Intermediate	22	Limited
	NWDA-1	22	Intermediate	26	Intermediate
	RIB-A	16	Limited	23	Intermediate
Delaware Creek - West Fork Trinity River	MOC-A	22	Intermediate	24	Intermediate
Farmer's Branch - Elm Fork Trinity River	FARM-1	25	Intermediate	25	Intermediate
Five Mile Creek – Trinity River	FIV-A	-	Creek inaccessible	-	Creek inaccessible
	FIV-B	25	Intermediate	27	Intermediate
	NEW-A	26	Intermediate	20	Limited
	SEDA-1	27	Intermediate	21	Limited
Floyd Branch - White Rock Creek	FLO-A	26	Intermediate	28	Intermediate
	MCK-C	26	Intermediate	23	Intermediate
Headwaters Five Mile Creek	FIV-D	24	Intermediate	25	Intermediate
Headwaters Ten Mile Creek	TEN-B	25	Intermediate	27	Intermediate
	TEN-D	33	High	30	High
Headwaters Turtle Creek	CEB-B	14	Limited	21	Limited
	KNI-A	29	High	14	Limited
	TRO-A	27	Intermediate	26	Intermediate
	TUR-A	25	Intermediate	25	Intermediate
Prairie Creek - Trinity River	PRA-A	24	Intermediate	23	Intermediate
South Mesquite Creek	SMC-A	25	Intermediate	21	Limited
	SMC-B	24	Intermediate	16	Limited
	SMC-C	25	Intermediate	24	Intermediate
Turtle Creek - Trinity River	CEDR-1	21	Limited	21	Limited
	COO-A	22	Intermediate	21	Limited
White Rock Creek-White Rock Lake	DIX-A	24	Intermediate	24	Intermediate

Table B-5a Water Quality Data 1

HUC Watershed	Sample ID	Collection Date	Temperature (°C)	pH	Turbidity (NTU)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Ammonia (as N) (mg/L)	Nitrate + Nitrite (as N) (mg/L)	Total Phosphorus (as P) (mg/L)	Chemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)
Bachman Branch - Elm Fork Trinity River	ELMT-1	4/23/2019	21.1	7.84	12	1705	8.2	<0.20	0.027	<0.05	31.9	8
		8/19/2019	27.2	7.49	26	709	4.50	<0.30	0.22	0.27	<20	24
		8/19/2019	27.2	7.52	26	708	4.48	<0.30	0.23	0.27	<20	24
	JOES-1	4/3/2019	15.2	7.64	5	791	8.5	<0.20	0.92	<0.05	<20	5
		8/1/2019	28.1	7.64	31	761	3.98	<0.30	0.71	<0.05	<20	27
	BAB-B	3/18/2019	12.5	7.65	0	777	10.30	<0.20	0.58	<0.05	15.1	0
		7/16/2019	27.2	7.84	13	755	6.04	<0.20	0.32	<0.05	37.6	16
	LBAC-1	4/23/2019	21.6	7.89	13	400	8.10	<0.20	0.32	0.126	23.7	10
		8/19/2019	29.2	7.38	33	509	4.46	<0.30	0.05	<0.05	<20	32
	CAC-A	4/23/2019	21.2	7.65	47	673	6.6	0.27	0.49	<0.05	25.6	43
		8/7/2019	30.6	7.24	38	771	1.92	0.87	0.071	0.26	84.10	50
	DAN-A	4/23/2019	20.9	7.37	29	718	2.2	2.70	0.029	0.394	33.9	27
		4/23/2019	20.8	7.41	29	727	2.2	1.86	0.079	0.361	38.6	22
		8/7/2019	30.9	7.61	106	554	2.61	1.65	<0.025	5.66	190	118
	NWD-5	4/23/2019	20.6	8.78	10	960	12.9	<0.20	0.054	<0.50	63.2	9
		8/7/2019	DRY									
	NWDA-1	4/3/2019	18.6	7.68	10	893	10.6	<0.20	0.68	<0.05	<20	13
		8/1/2019	29.0	7.32	20	821	6.60	<0.30	0.042	<0.05	<20	16
	RIB-A	4/11/2019	18.7	7.41	24	730	5.67	<0.20	0.44	0.075	26.5	26
		7/16/2019	26.9	7.37	24	1062	2.96	<0.20	0.20	<0.05	<20	22
	BAB-C	4/22/2019	21.5	8.30	7	865	11.59	<0.20	0.95	0.063	20.5	7
		8/8/2019	28.6	7.28	29	592	3.76	<0.30	0.11	<0.05	38.0	35
City of Dallas - White Rock Creek	ASH-A	5/7/2019	22.9	7.75	21	751	7.43	<0.20	0.82	<0.02	32	18
		5/7/2019	22.7	7.75	22	755	7.51	<0.20	0.87	<0.02	29.1	18
		9/4/2019	30.6	7.42	14	267	2.15	<0.30	<0.025	<0.05	58.1	18
	WHC-A	5/7/2019	24.6	7.74	36	405	7.34	<0.20	0.73	0.076	33.8	39
		9/4/2019	29.6	7.78	45	325	6.56	<0.30	0.027	<0.05	40.2	49

Table B-5a Water Quality Data 1

HUC Watershed	Sample ID	Collection Date	Temperature (°C)	pH	Turbidity (NTU)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Ammonia (as N) (mg/L)	Nitrate + Nitrite (as N) (mg/L)	Total Phosphorus (as P) (mg/L)	Chemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)
Delaware Creek - West Fork Trinity River	DELA-1	4/29/2019	22.2	7.35	15	644	4.28	<0.20	0.34	0.123	25.3	21
		8/20/2019	28.3	7.49	25	767	5.10	<0.30	0.074	0.07	<20	21
	LMOC-1	4/29/2019	22.7	8.75	45	376	8.70	0.39	<0.025	<0.05	<20	50
		4/29/2019	22.7	8.76	46	375	8.68	0.26	<0.025	<0.05	20.1	51
		8/20/2019	30.8	7.21	45	526	2.47	1.83	<0.025	0.44	37.1	39
	MOC-A	3/20/2019	16.2	7.81	8	545	12.79	<0.20	0.15	<0.05	24.3	6
		7/10/2019	31.6	8.23	65	431	7.33	<0.40	0.056	0.082	25.7	66
Duck Creek	LON-B	5/17/2019	21.8	7.81	15	612	7.11	0.36	0.22	<0.05	38.3	9
		8/26/2019	30.1	7.46	15	659	3.84	<0.30	0.093	<0.05	37.8	16
		8/26/2019	30.1	7.51	17	668	3.80	<0.30	0.098	<0.05	48.7	15
Farmer's Branch - Elm Fork Trinity River	EFCB-1	4/17/2019	20.2	8.10	31	678	8.95	<0.20	0.17	<0.05	<20	35
		8/7/2019	33.1	7.93	69	507	8.58	<0.30	0.052	0.19	52.20	67
	FARM-1	4/3/2019	15.0	7.93	18	461	10.7	<0.20	0.19	<0.05	<20	18
		8/1/2019	28.9	7.57	61	495	5.30	<0.30	0.039	<0.05	<20	53
Fish Creek - Mountain Creek Lake	ART-A	5/29/2019	24.0	8.08	17	890	8.23	<0.20	0.25	<0.05	<20	17
		9/9/2019	27.3	9.07	74	1213	7.21	<0.30	<0.025	0.190	54.7	76
	MOC-B	5/28/2019	27.6	8.37	24	415	8.53	<0.20	0.33	<0.05	<20	26
		9/9/2019	28.4	7.45	50	415	6.13	<0.30	0.040	<0.05	42.0	46
Five Mile Creek - Trinity River	ELA-A	5/16/2019	21.2	7.78	7	768	7.46	<0.20	1.0	0.067	<20	7
		9/9/2019	25.3	7.46	8	750	4.70	<0.30	1.1	<0.05	34.5	6
	ELA-B	5/16/2019	22.2	7.69	9	804	7.93	<0.20	1.2	0.062	<20	6
		5/16/2019	22.2	7.70	4	818	8.01	<0.20	1.1	0.066	<20	7
		9/9/2019	27.3	7.65	5	612	5.94	<0.30	0.065	<0.05	38.6	5
	FIV-A	3/19/2019	16.2	8.06	15	651	9.8	<0.20	1.1	0.054	19.5	14
		7/15/2019	25.7	7.57	17	599	6.92	<0.20	0.31	<0.05	32.20	18
		7/15/2019	25.7	7.69	17	597	6.91	<0.20	0.31	<0.05	20.50	18
	FIV-B	3/19/2019	14.1	7.90	20	670	9.9	<0.20	1.3	0.062	11.4	14
		3/19/2019	13.6	7.95	19	685	9.9	<0.20	1.3	0.104	11.2	18
		7/15/2019	25.7	7.27	17	613	5.93	<0.20	0.43	<0.05	27.7	17
	NEW-A	3/20/2019	13.9	7.97	16	640	10.0	<0.20	0.65	0.362	21.5	13
		7/10/2019	26.6	7.50	10	603	6.89	<0.40	0.49	<0.05	<20	11
		7/10/2019	26.7	7.69	10	604	6.89	<0.40	0.50	<0.05	<20	10

Table B-5a Water Quality Data 1

HUC Watershed	Sample ID	Collection Date	Temperature (°C)	pH	Turbidity (NTU)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Ammonia (as N) (mg/L)	Nitrate + Nitrite (as N) (mg/L)	Total Phosphorus (as P) (mg/L)	Chemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)
Five Mile Creek - Trinity River	SDAL-1	5/16/2019	20.7	7.84	10	673	7.67	<0.20	2.7	<0.05	<20	8
		9/4/2019	26.2	7.73	8	713	6.33	<0.30	2.4	<0.05	33.3	4
	SEDA-1	4/3/2019	16.3	7.44	6	861	8.39	<0.20	0.52	0.056	28.5	11
		4/3/2019	16.2	7.49	16	866	8.38	<0.20	0.50	<0.05	26.2	10
		8/1/2019	24.5	7.30	24	766	6.67	<0.30	0.38	<0.05	<20	23
Floyd Branch - White Rock Creek	COT-C	4/17/2019	19.3	8.05	2	758	8.68	<0.20	1.2	<0.05	<20	1
		8/7/2019	32	7.64	0	453	6.07	<0.20	0.34	<0.05	30.3	0
	FLO-A	3/21/2019	13.9	7.72	0	925	10.47	<0.20	9.0	1.60	27.4	0
		7/8/2019	26.7	8.03	11	801	7.69	<0.40	9.4	<0.05	20.9	7
	MCK-C	3/18/2019	15.7	7.80	3	749	11.23	<0.20	1.0	<0.05	10.3	0
		7/16/2019	26.0	8.04	13	751	7.13	<0.20	0.42	<0.05	32.2	9
Grapevine Creek - Elm Fork Trinity	HUTT-1	4/17/2019	20.3	7.97	12	506	8.12	<0.20	0.26	<0.05	<20	7
		8/7/2019	34.9	7.93	169	436	9.35	<0.30	<0.025	0.08	51.6	167
Headwaters Five Mile Creek	CRO-A	5/29/2019	24.6	7.95	7	681	8.48	<0.20	1.4	<0.05	<20	10
		9/9/2019	DRY									
	FIV-C	5/16/2019	22.1	7.92	4	709	8.55	<0.20	2.0	<0.05	<20	7
		9/9/2019	28.5	7.56	12	469	8.05	<0.30	0.082	<0.05	48.1	12
	FIV-D	3/21/2019	15.0	7.78	0	646	10.45	<0.20	1.1	<0.05	15.1	0
		7/8/2019	28.3	7.07	20	591	6.06	<0.40	0.36	<0.05	20.4	14
	FIV-E	5/29/2019	23.8	8.14	4	759	9.05	<0.20	0.86	<0.05	<20	9
		9/9/2019	27.0	7.20	14	964	8.35	<0.30	0.13	<0.05	42.0	14
	RIC-B	5/28/2019	25.1	8.27	6	610	8.69	<0.20	1.1	<0.05	<20	6
		9/9/2019	26.8	7.98	21	430	8.05	<0.30	0.44	0.09	41.3	23
	WOO-A	5/29/2019	25.3	7.90	8	666	8.58	<0.20	1.1	<0.05	<20	8
		9/9/2019	26.4	7.04	23	595	9.14	<0.30	0.64	<0.05	38.0	25

Table B-5a

Water Quality Data 1

HUC Watershed	Sample ID	Collection Date	Temperature (°C)	pH	Turbidity (NTU)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Ammonia (as N) (mg/L)	Nitrate + Nitrite (as N) (mg/L)	Total Phosphorus (as P) (mg/L)	Chemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)
Headwaters Ten Mile Creek	TEN-B	3/20/2019	13.7	7.56	7	592	9.17	<0.20	0.12	<0.50	19	5
		3/20/2019	13.4	7.74	7	614	9.17	<0.20	0.86	<0.50	21.6	5
		7/10/2019	27.6	7.70	10	537	6.79	<0.40	0.28	<0.50	<20	18
	TEN-D	3/21/2019	16.7	7.85	0	611	11.42	<0.20	0.91	<0.05	14	0
		7/8/2019	28.9	7.55	14	550	8.65	<0.40	0.34	<0.05	20.5	14
Headwaters Turtle Creek	DAEB-1	5/7/2019	24.2	7.77	15	758	7.12	<0.20	1.2	0.085	21.2	10
		8/22/2019	29.9	7.48	12	786	6.57	<0.30	0.26	<0.05	31.1	12
	DAEB-2	5/7/2019	25.5	7.67	52	924	5.98	0.21	2.0	0.16	21.8	79
		8/22/2019	28.5	7.34	38	835	3.33	<0.30	0.50	0.105	24.7	42
		8/22/2019	28.4	7.38	38	839	3.52	<0.30	0.50	0.110	20.70	39
	CBD-2	5/7/2019	22.3	7.82	0	788	6.65	<0.20	1.1	0.142	26.8	0
		8/26/2019	28.4	8.13	23	745	6.15	<0.30	2.0	0.14	47.6	14
	CEB-B	3/18/2019	15.9	7.80	12	827	10.20	<0.20	1.7	<0.05	14.1	11
		7/15/2019	24.6	7.54	8	756	6.06	<0.20	2.1	<0.50	24.3	7
	KNI-A	3/18/2019	14.8	8.28	13	798	10.90	<0.20	1.2	<0.50	11.6	11
		7/15/2019	24.2	8.03	20	928	7.00	<0.20	0.78	<0.50	29.8	12
	TRO-A	4/2/2019	16.3	7.86	20	945	10.62	<0.20	0.42	0.105	41.5	18
		7/18/2019	27.7	7.49	31	1228	2.78	<0.20	0.21	0.1	20.0	27
	TRO-C	4/23/2019	21.5	8.17	21	785	8.51	<0.20	1.3	<0.05	<20	17
		8/19/2019	28.5	7.56	22	789	5.51	<0.30	0.46	<0.05	<20	23
	TUR-A	4/11/2019	18.7	7.68	24	815	6.47	<0.20	2.0	<0.05	<20	21
		7/18/2019	27.0	7.82	9	890	6.26	<0.20	1.9	<0.05	<20	8
	TUR-C	4/23/2019	21.2	7.93	11	628	8.76	<0.20	1.1	0.054	21.6	2
		8/8/2019	28.9	7.46	34	575	4.80	<0.30	0.25	0.11	37.9	37
Headwaters White Rock Creek	UWRC-1	4/17/2019	19.0	7.83	9	488	8.62	<0.20	0.65	<0.05	<20	3
		8/7/2019	30.4	8.14	19	319	8.67	<0.30	0.19	<0.05	31.7	17
Hickory Creek - Parsons Slough	HIC-D	5/28/2019	24.1	7.66	13	853	6.87	<0.20	0.12	<0.05	<20	8
		9/9/2019	26.0	7.21	11	1106	3.97	<0.30	0.027	<0.05	43	9
	ATEN-1	5/28/2019	26.1	7.79	9	569	6.09	<0.20	0.12	0.067	21	11
		9/9/2019	DRY									

Table B-5a (continued) Water Quality Data 1

HUC Watershed	Sample ID	Collection Date	Temperature (°C)	pH	Turbidity (NTU)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Ammonia (as N) (mg/L)	Nitrate + Nitrite (as N) (mg/L)	Total Phosphorus (as P) (mg/L)	Chemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)
Indian Creek - Elm Fork Trinity River	FUR-A	4/17/2019	20.0	7.97	15	570	8.38	<0.20	0.62	<0.05	<20	12
		8/7/2019	30.6	7.86	21	534	7.72	<0.30	0.46	0.08	33.0	17
Pitman Creek - Spring Creek	SPC-A	4/22/2019	20.4	7.85	16	751	7.97	<0.20	1.5	0.08	25.8	12
		8/7/2019	25.6	7.69	18	717	8.23	<0.30	0.39	<0.05	25.6	25
		8/7/2019	25.6	7.72	18	714	8.14	<0.30	0.39	<0.05	30.1	25
Prairie Creek – Trinity River	PRA-A	3/20/2019	14.5	7.78	15	636	9.6	<0.20	0.062	0.05	25.7	12
		7/10/2019	29.1	7.25	13	541	5.86	<0.40	0.11	0.053	<20	17
	PRAI-2	5/7/2019	22.7	7.89	20	556	7.74	<0.20	0.40	<0.05	27.2	12
		9/4/2019	25.5	7.28	9	342	3.66	<0.30	0.082	<0.05	32.2	7
South Mesquite Creek	SMC-A	3/19/2019	14.1	7.55	9	645	9.34	<0.20	0.30	0.062	27.2	6
		7/16/2019	27.9	7.46	27	544	6.36	<0.20	0.028	<0.05	44.9	26
	SMC-B	4/2/2019	12.6	7.60	4	640	8.33	<0.20	0.062	0.052	32.7	6
		7/18/2019	26.8	7.27	32	631	5.48	<0.20	0.072	<0.05	<20	33
	SMC-C	4/11/2019	20.4	7.81	10	402	6.92	<0.20	0.23	<0.05	30.3	7
		7/18/2019	28.1	7.42	26	587	5.00	<0.20	0.060	<0.05	<20	25
White Rock Creek - White Rock Lake	DIX-A	3/19/2019	14.1	7.57	0	716	9.84	<0.20	0.92	<0.05	21.5	0
		7/16/2019	26.9	7.28	18	634	3.95	<0.20	0.44	<0.05	31.8	16
	JAC-A	4/22/2019	21.8	7.80	8	701	8.55	<0.20	1.7	<0.05	<20	8
		8/8/2019	29.1	7.36	18	518	6.42	<0.30	0.76	<0.05	26.35	25
	MCC-A	4/23/2019	21.1	7.48	12	584	6.81	<0.20	1.2	0.059	<20	6
		8/20/2019	31.7	7.44	24	358	4.27	<0.30	<0.025	<0.02	<20	23
		8/20/2019	31.7	7.47	24	358	4.27	<0.30	<0.025	<0.05	21.2	23
	WIL-A	4/23/2019	21.3	7.57	25	765	5.14	<0.20	1.4	0.112	<20	27
		8/19/2019	30.9	7.26	35	337	4.08	<0.30	0.036	<0.05	<20	36
	WHC-C	4/22/2019	21.2	8.05	19	642	9.37	<0.20	1.5	0.096	27.6	23
		4/22/2019	20.7	8.10	19	645	9.36	<0.20	1.6	0.112	24.6	23
		8/8/2019	29.3	7.35	32	479	6.26	<0.30	2.0	0.27	29.0	39

Table B-5a (continued) Water Quality Data 1

HUC Watershed	Sample ID	Collection Date	Temperature (°C)	pH	Turbidity (NTU)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Ammonia (as N) (mg/L)	Nitrate + Nitrite (as N) (mg/L)	Total Phosphorus (as P) (mg/L)	Chemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)
Turtle Creek-Trinity River	CEC-B	5/16/2019	23.1	8.14	1	713	9.12	<0.20	3.8	<0.50	<20	1
		9/4/2019	28.6	8.45	10	479	9.71	<0.30	0.97	0.20	40.1	12
	CEDR-1	4/3/2019	14.8	7.81	1	731	8.50	<0.20	1.8	<0.05	<20	3
		8/1/2019	27.0	7.39	14	717	4.17	<0.30	1.1	<0.05	<20	20
		8/1/2019	27.0	7.42	14	701	4.16	<0.30	0.90	<0.05	<20	20
	COO-A	4/2/2019	18.1	8.15	2	693	10.88	<0.20	2.2	0.076	32.3	5
		7/18/2019	27.7	7.63	25	635	7.05	<0.20	1.2	<0.05	<20	19
	DAWB-3	5/7/2019	25.3	7.52	20	561	5.67	<0.20	0.60	0.06	22.4	21
		8/26/2019	31.1	7.83	24	843	7.83	<0.30	0.45	0.055	45.0	25
	FIL-A	5/7/2019	26.0	7.86	10	563	7.60	0.25	0.38	<0.05	23.9	11
		8/22/2019	32.2	7.72	38	854	8.45	<0.30	0.13	0.062	31.5	37
	LAC-A	5/7/2019	26.4	9.26	35	256	16.90	<0.20	0.28	0.082	23.6	67
		8/26/2019	30.6	7.93	39	328	6.96	<0.30	0.034	<0.05	58.3	24
	LAC-B	5/7/2019	23.5	7.65	13	690	9.55	<0.20	3.2	<0.05	26.2	18
		8/26/2019	30.1	7.84	24	462	7.70	<0.30	0.88	<0.05	60.0	19
	WDAL-1	4/29/2019	23.0	7.65	44	503	6.37	<0.20	0.75	<0.05	21.7	48
		8/20/2019	30.1	7.30	448*	838	8.60	<0.30	0.30	0.84	69.7	534*
	WDAL-2	4/29/2019	21.0	6.94	6	1085	6.92	<0.20	10.4	0.051	<20	6
		8/26/2019	24.3	7.01	45	1244	6.20	<0.30	11.4	<0.05	39.4	30

- Creek was drying up

Table B-5b Water Quality Data 2

HUC Watershed	Sample ID	Collection Date	*E. coli*	Total Coliform	Surfactants (mg/L)	Copper (mg/L)	Iron (mg/L)	Hardness (mg/L)	Flow
			(MPN / 100ml)	(MPN / 100ml)					(cu ft / sec)
Bachman Branch - Elm Fork Trinity River	ELMT-1	4/23/2019	290.9	>2419.6	<0.50	<0.020	<0.50	428	0.463
		8/19/2019	648.8	>2419.6	<0.50	<0.020	<0.50	218	1.500
		8/19/2019	1046.2	>2419.6	<0.50	<0.020	<0.50	217	
	JOES-1	4/3/2019	1553.1	>2419.6	<0.50	<0.020	<0.50	336	Unwadable
		8/1/2019	1732.9	>2419.6	<0.50	<0.020	0.54	308	No Flow
	BAB-B	3/18/2019	Lab missed hold time, recollected		<0.50	<0.020	<0.50	318	22.447
		3/19/2019	150	2419.6	Lab missed hold time for samples collected on 3/18/2019, samples were recollected on				
		7/16/2019	166.4	>2419.6	<0.50	<0.020	<0.50	262	0.600
	LBAC-1	4/23/2019	69.7	>2419.6	<0.50	<0.020	<0.50	144	Inaccessible
		8/19/2019	24.1	>2419.6	<0.50	<0.20	<0.50	176	Inaccessible
	CAC-A	4/23/2019	131.4	>2419.6	<0.50	<0.020	0.73	204	Inaccessible
		8/7/2019	117.8	>2419.6	<0.50	<0.020	0.58	204	No Flow
	DAN-A	4/23/2019	>2419.6	>2419.6	<0.50	<0.020	0.61	241	Inaccessible
		4/23/2019	>2419.6	>2419.6	0.57	<0.020	0.59	241	
		8/7/2019	Samples not analyzed		0.55	<0.020	<0.50	183	No Flow
	NWD-5	4/23/2019	613.1	>2419.6	<0.50	0.048	<0.50	274	0.175
		8/7/2019	DRY						
	NWDA-1	4/3/2019	24.1	>2419.6	<0.50	<0.020	<0.50	268	10.535
		8/1/2019	53.7	>2419.6	<0.50	<0.020	0.51	202	No Flow
	RIB-A	4/11/2019	90.5	>2419.6	<0.50	<0.020	0.75	230	7.843
		7/18/2019	547.5	>2419.6	<0.50	<0.020	<0.50	262	0.200
	BAB-C	4/22/2019	579.4	>2419.6	<0.50	<0.020	<0.50	369	Inaccessible
		8/8/2019	77.1	>2419.6	<0.50	<0.020	<0.50	216	Inaccessible
City of Dallas - White Rock Creek	ASH-A	5/7/2019	461.1	>2419.6	<0.50	<0.020	<0.50	363	No Flow
		5/7/2019	410.6	>2416.9	<0.50	<0.020	<0.50	368	
		9/4/2019	151.5	>2419.6	<0.50	<0.020	<0.50	116	Unwadable
	WHC-A	5/7/2019	285.1	>2419.6	<0.50	<0.020	<0.50	182	Inaccessible
		9/4/2019	52	>2419.6	<0.50	<0.020	<0.50	124	Inaccessible

Table B-5b (continued) Water Quality Data 2

HUC Watershed	Sample ID	Collection Date	E. coli	Total Coliform	Surfactants (mg/L)	Copper (mg/L)	Iron (mg/L)	Hardness (mg/L)	Flow
			(MPN / 100ml)	(MPN / 100ml)					(cu ft / sec)
Delaware Creek - West Fork Trinity River	DELA-1	4/29/2019	410.6	>2419.6	<0.50	<0.020	<0.50	210	No Flow
		8/20/2019	172.5	>2419.6	<0.50	<0.020	0.57	190	3.761
	LMOC-1	4/29/2019	>2419.6	>2419.6	<0.50	<0.020	0.53	144	Inaccessible
		4/29/2019	>2419.6	>2419.6	<0.50	<0.020	0.85	142	
		8/20/2019	>2419.6	>2419.6	0.99	<0.020	<0.50	159	Inaccessible
	MOC-A	3/20/2019	9.8	>2419.6	<0.50	<0.020	<0.50	217	9.134
		7/10/2019	28.2	>2419.6	<0.50	<0.020	0.59	159	1.100
Duck Creek	LON-B	5/7/2019	365.4	>2419.6	<0.50	<0.020	<0.50	242	4.126
		8/26/2019	272.3	>2419.6	<0.50	<0.020	<0.50	194	No Flow
		8/26/2019	172.2	>2419.6	<0.50	<0.020	<0.50	197	
Farmer's Branch - Elm Fork Trinity River	EFCB-1	4/17/2019	16.9	>2419.6	<0.50	<0.020	0.51	258	Unwedable
		8/7/2019	14.6	>2419.6	<0.50	<0.020	6.9	192	Inaccessible
	FARM-1	4/3/2019	38.4	>2419.6	<0.50	<0.020	<0.50	171	11.990
		8/1/2019	53.7	>2419.6	<0.50	<0.020	1.2	165	1.900
Fish Creek - Mountain Creek Lake	ART-A	5/29/2019	142.1	>2419.6	<0.50	<0.020	<0.50	431	No Flow
		9/9/2019	4.1	>2419.6	<0.50	<0.020	0.70	25.6	0.750
	MOC-B	5/28/2019	5.2	>2419.6	<0.50	<0.020	<0.50	152	Unwedable
		9/9/2019	41.9	>2419.6	<0.50	<0.020	<0.50	143	Unwedable
Five Mile Creek - Trinity River	ELA-A	5/16/2019	727	>2419.6	<0.50	<0.020	<0.50	331	57.173
		9/9/2019	122.3	>2419.6	<0.50	<0.020	<0.50	317	0.100
	ELA-B	5/16/2019	186	>2419.6	<0.50	<0.020	<0.50	320	19.338
		5/16/2019	172.3	>2419.6	<0.50	<0.020	<0.50	325	
		9/9/2019	135.4	>2419.6	<0.50	<0.020	<0.50	270	0.100
	FIV-A	3/19/2019	43.5	755.6	<0.50	<0.020	<0.50	324	Inaccessible
		7/15/2019	30.1	>2419.6	<0.50	<0.020	<0.50	285	Inaccessible
		7/15/2019	46.4	>2419.6	<0.50	<0.020	<0.50	286	
	FIV-B	3/19/2019	344.8	>2419.6	<0.50	<0.020	<0.50	327	44.830
		3/19/2019	122.3	>2419.6	<0.50	<0.020	<0.50	325	
		7/15/2019	73.3	>2419.6	<0.50	<0.020	<0.50	296	0.200
	NEW-A	3/20/2019	101	>2419.6	<0.50	<0.020	<0.50	314	13.759
		7/10/2019	82.3	>2419.6	<0.50	<0.020	<0.50	307	3.300
		7/10/2019	128.1	>2419.6	<0.50	<0.020	<0.50	302	

Table B-5b (continued) Water Quality Data 2

HUC Watershed	Sample ID	Collection Date	E. coli	Total Coliform	Surfactants (mg/L)	Copper (mg/L)	Iron (mg/L)	Hardness (mg/L)	Flow
			(MPN / 100ml)	(MPN / 100ml)					(cu ft / sec)
Five Mile Creek - Trinity River	SDAL-1	5/16/2019	387.3	>2419.6	<0.50	<0.020	<0.50	375	2.474
		9/4/2019	178.2	>2419.6	<0.50	<0.020	<0.50	329	1.100
	SEDA-1	4/3/2019	128.1	>2419.6	<0.50	<0.020	<0.50	369	8.885
		4/3/2019	154.1	>2419.6	<0.50	<0.020	<0.50	388	
		8/1/2019	6.3	>2419.6	<0.50	<0.020	<0.50	375	0.200
Floyd Branch - White Rock Creek	COT-C	4/17/2019	770.1	>2419.6	<0.50	<0.020	<0.50	323	13.822
		8/7/2019	613.1	>2419.6	<0.50	<0.020	<0.50	174	1.900
	FLO-A	3/21/2019	185	>2419.6	<0.50	<0.020	<0.50	316	12.925
		7/8/2019	224.7	>2419.6	<0.50	<0.020	<0.50	254	0.400
	MCK-C	3/18/2019	387.3	>2419.6	<0.50	<0.020	<0.50	352	2.211
		7/16/2019	410.6	>2419.6	<0.50	<0.020	<0.50	280	0.400
Grapevine Creek - Elm Fork Trinity River	HUTT-1	4/17/2019	65	>2419.6	<0.50	<0.020	<0.50	180	12.507
		8/7/2019	Samples not analyzed		<0.50	<0.020	1.3	185	1.200
Headwaters Five Mile Creek	CRO-A	5/29/2019	290.9	>2419.6	<0.50	<0.020	<0.50	307	18.445
		9/9/2019	DRY						
	FIV-C	5/16/2019	517.2	>2419.6	<0.50	<0.020	<0.50	338	8.390
		9/9/2019	235.9	>2419.6	<0.50	<0.020	<0.50	199	0.700
	FIV-D	3/21/2019	186	2419.6	<0.50	<0.020	<0.50	287	5.350
		7/8/2019	307.6	>2419.6	<0.50	<0.020	<0.50	254	0.400
	FIV-E	5/29/2019	166.4	>2419.6	<0.50	<0.020	<0.50	334	37.993
		9/9/2019	36.8	>2419.6	<0.50	<0.020	<0.50	265	Inaccessible
	RIC-B	5/28/2019	214.2	>2419.6	<0.50	<0.020	<0.50	299	11.482
		9/9/2019	44.3	>2419.6	<0.50	0.021	<0.50	261	1.300
	WOO-A	5/29/2019	133.4	>2419.6	<0.50	<0.020	<0.50	314	49.980
		9/9/2019	84.7	>2419.6	<0.50	<0.020	<0.50	280	1.200

Table B-5b (continued) Water Quality Data 2

HUC Watershed	Sample ID	Collection Date	*E. coli*	Total Coliform	Surfactants (mg/L)	Copper (mg/L)	Iron (mg/L)	Hardness (mg/L)	Flow
			(MPN / 100ml)	(MPN / 100ml)					(cu ft / sec)
Headwaters Ten Mile Creek	TEN-B	3/20/2019	1413.6	>2419.6	<0.50	<0.020	<0.50	289	29.102
		3/20/2019	1553.1	>2419.6	<0.50	<0.020	<0.50	289	
		7/10/2019	111.2	>2419.6	<0.50	<0.020	<0.50	253	0.400
	TEN-D	3/21/2019	90.8	1299.7	<0.50	<0.020	<0.50	281	31.188
		7/8/2019	101.7	>2419.6	<0.50	<0.020	<0.50	252	2.000
Headwaters Turtle Creek	DAEB-1	5/7/2019	387.3	>2419.7	<0.50	<0.020	<0.50	275	6.142
		8/22/2019	86.2	>2419.6	<0.50	<0.020	<0.50	240	2.100
	DAEB-2	5/7/2019	1203.3	>2419.6	<0.50	<0.020	2.2	371	10.936
		8/22/2019	127.4	>2419.6	<0.50	<0.020	0.92	322	1.700
		8/22/2019	101.4	>2419.6	<0.50	<0.020	0.98	321	
	CBD-2	5/7/2019	461.1	>2419.6	<0.50	<0.020	>0.50	305	Inaccessible
		8/26/2019	>2419.6	>2419.6	<0.50	<0.020	<0.50	278	Inaccessible
	CEB-B	3/18/2019	1986.3	>2419.6	<0.50	<0.020	<0.50	390	3.712
		7/15/2019	517.2	>2419.6	<0.50	<0.020	<0.50	372	No Flow
	KNI-A	3/18/2019	104.6	>2419.6	<0.50	<0.020	<0.50	325	22.507
		7/15/2019	178.9	>2419.6	<0.50	<0.020	<0.50	317	0.300
	TRO-A	4/2/2019	178.5	>2419.6	<0.50	<0.020	<0.50	291	2.498
		7/18/2019	98.3	>2419.6	<0.50	<0.020	<0.50	316	0.400
	TRO-C	4/23/2019	143.9	>2419.6	<0.50	<0.020	<0.50	267	4.585
		8/19/2019	39.7	>2419.6	<0.50	<0.020	<0.50	235	1.000
	TUR-A	4/11/2019	396.8	>2419.6	<0.50	<0.020	<0.50	309	7.390
		7/18/2019	325.5	>2419.6	<0.50	<0.020	<0.50	316	1.200
	TUR-C	4/23/2019	248.1	>2419.6	<0.50	<0.020	<0.50	239	unwadable
		8/8/2019	1119.9	>2419.6	<0.50	<0.020	<0.50	212	unwadable
Headwaters White Rock Creek	UWRC-1	4/17/2019	145	>2419.6	<0.50	<0.020	<0.50	187	92.272
		8/7/2019	147	>2419.6	<0.50	<0.020	<0.50	113	1.700
Hickory Creek - Parsons Slough	HIC-D	5/28/2019	275.5	>2419.6	<0.50	<0.020	<0.050	320	1.907
		9/9/2019	52	>2419.6	<0.50	<0.020	<0.50	381	0.100
	ATEN-1	5/28/2019	38.9	>2419.6	<0.50	<0.020	<0.50	141	3.526
		9/9/2019	DRY						

Table B-5b (continued) Water Quality Data 2

HUC Watershed	Sample ID	Collection Date	*E. coli* (MPN / 100ml)	Total Coliform (MPN / 100ml)	Surfactants (mg/L)	Copper (mg/L)	Iron (mg/L)	Hardness (mg/L)	Flow (cu ft / sec)
Indian Creek - Elm Fork Trinity River	FUR-A	4/17/2019	65	>2419.6	<0.50	<0.020	<0.50	204	5.106
		8/7/2019	1	>2419.6	<0.50	<0.020	<0.50	181	No Flow
Pitman Creek - Spring Creek	SPC-A	4/22/2019	248.1	>2419.6	<0.50	<0.020	<0.50	320	Inaccessible
		8/7/2019	866.4	>2419.6	<0.50	<0.020	<0.50	314	0.400
		8/7/2019	488.4	>2419.6	<0.50	<0.020	<0.50	319	
Prairie Creek Trinity River	PRA-A	3/20/2019	162.4	2419.6	<0.50	<0.020	<0.50	241	Inaccessible
		7/10/2019	238.2	>2419.6	<0.50	<0.020	<0.50	210	1.100
	PRAI-2	5/7/2019	218.7	>2419.6	<0.50	<0.020	<0.50	217	No Flow
		9/4/2019	248.1	>2419.6	<0.50	<0.020	<0.50	124	Inaccessible
South Mesquite Creek	SMC-A	3/19/2019	117.8	>2419.6	<0.50	<0.020	<0.50	248	9.916
		7/16/2019	68.3	>2419.6	<0.50	<0.020	<0.50	159	0.100
	SMC-B	4/2/2019	41.4	>2419.6	<0.50	<0.020	<0.50	202	6.311
		7/18/2019	46.5	>2419.6	<0.50	<0.020	<0.50	184	No Flow
	SMC-C	4/11/2019	1299.7	>2419.6	<0.50	<0.020	<0.50	124	8.052
		7/18/2019	37.4	>2419.6	<0.50	<0.020	<0.50	154	0.200
White Rock Creek - White Rock Lake	DIX-A	3/19/2019	410.6	>2419.6	<0.50	<0.020	<0.50	314	12.651
		7/16/2019	260.3	>2419.6	<0.50	<0.020	<0.50	300	0.100
	JAC-A	4/22/2019	770.1	>2419.6	<0.50	<0.020	<0.50	339	11.691
		8/8/2019	365.4	>2419.6	<0.50	<0.020	<0.50	221	0.400
	MCC-A	4/23/2019	201.4	>2419.6	<0.50	<0.020	<0.50	261	unwadable
		8/20/2019	40.8	>2419.6	<0.50	<0.020	<0.50	147	Inaccessible
		8/20/2019	57.8	>2419.6	<0.50	<0.020	<0.50	144	
	WIL-A	4/23/2019	579.4	>2419.6	<0.50	<0.020	<0.50	337	unwadable
		8/19/2019	161.6	>2419.6	<0.50	<0.020	<0.50	139	Inaccessible
	WHC-C	4/22/2019	648.8	>2419.6	<0.50	<0.020	<0.50	281	Inaccessible
		4/22/2019	980.4	>2419.6	<0.50	<0.020	<0.50	276	
		8/8/2019	727	>2419.6	<0.50	<0.020	<0.050	175	Inaccessible

Table B-5b (continued) Water Quality Data 2

HUC Watershed	Sample ID	Collection Date	*E. coli*	Total Coliform	Surfactants (mg/L)	Copper (mg/L)	Iron (mg/L)	Hardness (mg/L)	Flow
			(MPN / 100ml)	(MPN / 100ml)					(cu ft / sec)
Turtle Creek - Trinity River	CEC-B	5/16/2019	770.1	>2419.6	<0.50	<0.020	<0.50	333	10.688
		9/4/2019	461.1	>2419.6	<0.50	<0.020	<0.50	176	1.700
	CEDR-1	4/3/2019	298.7	>2419.6	<0.50	<0.020	<0.50	301	14.449
		8/1/2019	70.3	>2419.6	<0.50	<0.020	<0.50	287	0.200
		8/1/2019	90.9	>2419.6	<0.50	<0.020	<0.50	295	
	COO-A	4/2/2019	52.9	2419.6	<0.50	<0.020	<0.50	266	4.031
		7/18/2019	435.2	>2419.6	<0.50	<0.020	<0.50	240	1.800
	DAWB-3	5/7/2019	148.3	>2419.6	<0.50	<0.020	<0.50	228	No Flow
		8/26/2019	<1	>2419.6	<0.50	<0.020	0.61	353	1.900
	FIL-A	5/7/2019	79.4	>2419.6	<0.50	<0.020	<0.50	211	13.847
		8/22/2019	11	>2419.6	<0.50	<0.020	0.69	306	2.100
	LAC-A	5/7/2019	78	2419.6	<0.50	<0.020	<0.50	107	Inaccessible
		8/26/2019	1	>2419.6	<0.50	<0.020	<0.50	108	Unwadable
	LAC-B	5/7/2019	285.1	>2419.6	<0.50	<0.020	<0.50	280	No Flow
		8/26/2019	27.9	>2419.6	<0.50	<0.020	<0.50	158	Unwadable
	WDAL-1	4/29/2019	410.6	>2419.6	<0.50	<0.020	0.86	189	No Flow
		8/20/2019	9590	>2419.6	<0.50	<0.20	10.5	474	1.500
	WDAL-2	4/29/2019	48.1	2419.6	<0.50	<0.020	<0.50	463	No Flow
		8/26/2019	240	>2419.6	<0.50	<0.020	<0.50	539	0.900

Table B-5c Water Quality Data (Pesticides 1)

HUC Watershed	Sample ID	Collection Date	4,4'-DDD (µg/L)	4,4'-DDE (µg/L)	4,4'-DDT (µg/L)	Aldrin (µg/L)	Alpha BHC (µg/L)	Atrazine (µg/L)	Beta BHC (µg/L)
Bachman Branch - Elm Fork Trinity River	JOES-1	4/3/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.051	0.29 *,#	< 0.051
		8/1/2019	<0.097	<0.097	<0.019	<0.0097	<0.049	<0.095	<0.049
	BAB-B	3/18/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	1.5	< 0.050
		7/16/2019	<0.099	<0.099	<0.020	<0.0099	<0.050	0.1	<0.050
	NWDA-1	4/3/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	0.19 *, #	< 0.050
		8/1/2019	<0.098	<0.098	<0.020	<0.0098	<0.049	<0.095	<0.049
	RIB-A	4/11/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	0.2	< 0.050
		7/18/2019	<0.098	<0.098	<0.020	<0.0098	<0.049	<0.1	<0.049
Delaware Creek - West Fork Trinity River	MOC-A	3/20/2019	< 0.099	< 0.099	< 0.020	< 0.0099	< 0.050	0.14	< 0.050
		7/10/2019	<0.096	<0.096	<0.019	<0.0096	<0.048	0.8	<0.048
Farmer's Branch - Elm Fork Trinity River	FARM-1	4/3/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	1.1 *, #	< 0.050
		8/1/2019	<0.097	<0.097	<0.019	<0.0097	<0.049	<0.095	<0.049
Five Mile Creek – Trinity River	FIV-A	3/19/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	<0.096	< 0.050
		7/15/2019	Lab did not run samples due to login error					<0.10	Lab Error
		7/15/2019						<0.10	
	FIV-B	3/19/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	<0.10	< 0.050
		3/19/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	<0.096	< 0.050
		7/15/2019	Lab did not run samples due to login error					<0.10	Lab Error
	NEW-A	3/20/2019	< 0.010	< 0.010	< 0.020	< 0.010	< 0.050	<0.096	< 0.050
		7/10/2019	<0.097	<0.097	<0.019	<0.0097	<0.049	<0.1	<0.049
		7/10/2019	<0.10	<0.10	<0.020	<0.010	<0.051	<0.1	<0.051
	SEDA-1	4/3/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	<0.095 *, #	< 0.050
		4/3/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	<0.095 *, #	< 0.050
		8/1/2019	<0.098	<0.098	<0.020	<0.0098	<0.049	<0.095	<0.049
Floyd Branch - White Rock Creek	FLO-A	3/21/2019	< 0.099	< 0.099	< 0.020	< 0.0099	< 0.050	<0.095	< 0.050
		7/8/2019	<0.10	<0.10	<0.021	<0.010	<0.052	<0.10	<0.052
	MCK-C	3/18/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	0.28	< 0.050
		7/16/2019	<0.10	<0.10	<0.020	<0.010	<0.051	<0.10	<0.051
Headwaters Five Mile Creek	FIV-D	3/21/2019	< 0.099	< 0.099	< 0.020	< 0.0099	< 0.050	<0.095	< 0.050
		7/8/2019	<0.097	<0.097	<0.019	<0.0097	<0.049	<0.10	<0.049

Table B-5c (continued) Water Quality Data (Pesticides 1)

HUC Watershed	Sample ID	Collection Date	4,4'-DDD (µg/L)	4,4'-DDE (µg/L)	4,4'-DDT (µg/L)	Aldrin (µg/L)	Alpha BHC (µg/L)	Atrazine (µg/L)	Beta BHC (µg/L)
Headwaters Ten Mile Creek	TEN-B	3/20/2019	< 0.099	< 0.099	< 0.020	< 0.0099	< 0.050	0.14	< 0.050
		3/20/2019	< 0.099	< 0.099	< 0.020	< 0.0099	< 0.050	0.13	< 0.050
		7/10/2019	<0.096	<0.096	<0.019	<0.0096	<0.048	<0.10	<0.048
	TEN-D	3/21/2019	< 0.099	< 0.099	< 0.020	< 0.0099	< 0.050	<0.095	< 0.050
		7/8/2019	<0.097	<0.0097	<0.019	<0.0097	<0.049	<0.10	<0.049
Headwaters Turtle Creek	CEB-B	3/18/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	0.15	< 0.050
		7/15/2019	Lab did not run samples due to login error					<0.10	Lab error
	KNI-A	3/18/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	0.11	< 0.050
		7/15/2019	Lab did not run samples due to login error					<0.1	Lab error
	TRO-A	4/2/2019	< 0.097	< 0.097	< 0.019	< 0.0097	< 0.049	<0.095	< 0.049
		7/18/2019	<0.098	<0.098	<0.020	<0.0098	<0.049	<0.1	<0.049
	TUR-A	4/11/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	<0.1	< 0.050
		7/18/2019	<0.098	<0.098	<0.020	<0.0098	<0.049	<0.1	<0.049
Prairie Creek - Trinity River	PRA-A	3/20/2019	< 0.010	< 0.010	< 0.020	< 0.010	< 0.050	0.94	< 0.050
		7/10/2019	<0.10	<0.1	<0.021	<0.010	<0.052	<0.1	<0.052
South Mesquite Creek	SMC-A	3/19/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	4.2	< 0.050
		7/16/2019	<0.097	<0.097	<0.019	<0.0097	<0.049	0.2	<0.049
	SMC-B	4/2/2019	< 0.097	< 0.097	< 0.019	< 0.0097	< 0.049	3.1	< 0.049
		7/18/2019	<0.099	<0.099	<0.020	<0.0099	<0.050	<0.1	<0.050
	SMC-C	4/11/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	1.8	< 0.050
		7/18/2019	<0.097	<0.097	<0.019	<0.0097	<0.049	0.1	<0.049
Turtle Creek - Trinity River	CEDR-1	4/3/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	<0.095 *, #	< 0.050
		8/1/2019	<0.097	<0.097	<0.019	<0.0097	<0.049	<0.095	<0.049
		8/1/2019	<0.099	<0.099	<0.020	<0.0099	<0.050	<0.095	<0.050
	COO-A	4/2/2019	< 0.097	< 0.097	< 0.019	< 0.0097	< 0.049	0.10	< 0.049
		7/18/2019	<0.097	<0.097	<0.019	<0.0097	<0.049	<0.1	<0.049
White Rock Creek - White Rock Lake	DIX-A	3/19/2019	< 0.10	< 0.10	< 0.020	< 0.010	< 0.050	0.16	< 0.050
		7/16/2019	<0.097	<0.097	<0.019	<0.0097	<0.049	<0.1	<0.049

Table B-5d Water Quality Data (Pesticides 2)

HUC Watershed	Sample ID	Collection Date	Chlordane (µg/L)	Delta BHC (µg/L)	Dieldrin (µg/L)	Endosulfan I (µg/L)	Endosulfan II (µg/L)	Endosulfan sulfate (µg/L)	Endrin (µg/L)
Bachman Branch - Elm Fork Trinity River	JOES-1	4/3/2019	< 0.20	< 0.051	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		8/1/2019	<0.19	<0.049	<0.019	<0.0097	<0.019	<0.097	<0.019
	BAB-B	3/18/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		7/16/2019	<0.20	<0.050	<0.020	<0.0099	<0.020	<0.099	<0.020
	NWDA-1	4/3/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		8/1/2019	<0.20	<0.049	<0.020	<0.0098	<0.020	<0.098	<0.020
	RIB-A	4/11/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		7/18/2019	<0.20	<0.049	<0.020	<0.0098	<0.020	<0.098	<0.020
Delaware Creek - West Fork Trinity River	MOC-A	3/20/2019	< 0.20	< 0.050	< 0.020	< 0.0099	< 0.020	< 0.099	< 0.020
		7/10/2019	<0.19	<0.048	<0.019	<0.0096	<0.019	<0.096	<0.019
Farmer's Branch - Elm Fork Trinity River	FARM-1	4/3/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		8/1/2019	<0.19	<0.049	<0.019	<0.0097	<0.019	<0.097	<0.019
Five Mile Creek – Trinity River	FIV-A	3/19/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		7/15/2019	Lab error – did not run samples due to login error						
		7/15/2019							
	FIV-B	3/19/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		3/19/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		7/15/2019	Lab error – did not run samples due to login error						
	NEW-A	3/20/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.010	< 0.020
		7/10/2019	<0.19	<0.049	<0.019	<0.0097	<0.019	<0.097	<0.019
		7/10/2019	<0.20	<0.051	<0.020	<0.010	<0.020	<0.10	<0.020
	SEDA-1	4/3/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		4/3/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		8/1/2019	<0.20	<0.049	<0.020	<0.0098	<0.020	<0.098	<0.020
Floyd Branch - White Rock Creek	FLO-A	3/21/2019	< 0.20	< 0.050	< 0.020	< 0.0099	< 0.020	< 0.099	< 0.020
		7/8/2019	<0.21	<0.052	<0.021	<0.010	<0.021	<0.10	<0.021
	MCK-C	3/18/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		7/16/2019	<0.20	<0.051	<0.020	<0.010	<0.020	<0.10	<0.020
Headwaters Five Mile Creek	FIV-D	3/21/2019	< 0.20	< 0.050	< 0.020	< 0.0099	< 0.020	< 0.099	< 0.020
		7/8/2019	<0.19	<0.049	<0.019	<0.0097	<0.019	<0.097	<0.019

Table B-5d (continued) Water Quality Data (Pesticides 2)

Permit-Listed Watershed	Sample ID	Collection Date	Chlordane (µg/L)	Delta BHC (µg/L)	Dieldrin (µg/L)	Endosulfan I (µg/L)	Endosulfan II (µg/L)	Endosulfan sulfate (µg/L)	Endrin (µg/L)
Headwaters Ten Mile Creek	TEN-B	3/20/2019	< 0.20	< 0.050	< 0.020	< 0.0099	< 0.020	< 0.099	< 0.020
		3/20/2019	< 0.20	< 0.050	< 0.020	< 0.0099	< 0.020	< 0.099	< 0.020
		7/10/2019	<0.19	<0.048	<0.019	<0.0096	<0.019	<0.096	<0.019
	TEN-D	3/21/2019	< 0.20	< 0.050	< 0.020	< 0.0099	< 0.020	< 0.099	< 0.020
		7/8/2019	<0.19	<0.049	<0.019	<0.0097	<0.019	<0.097	<0.019
Headwaters Turtle Creek	CEB-B	3/18/2019	< 0.20	< 0.050	0.082	< 0.010	< 0.020	< 0.10	< 0.020
		7/15/2019	Lab did not run samples due to login error						
	KNI-A	3/18/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		7/15/2019	Lab did not run samples due to login error						
	TRO-A	4/2/2019	< 0.19	< 0.049	< 0.019	< 0.0097	< 0.019	< 0.097	< 0.019
		7/18/2019	<0.20	<0.049	<0.020	<0.0098	<0.020	<0.098	<0.020
	TUR-A	4/11/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		7/18/2019	<0.20	<0.049	<0.020	<0.0098	<0.020	<0.098	<0.020
Prairie Creek - Trinity river	PRA-A	3/20/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.010	< 0.020
		7/10/2019	<0.21	<0.052	<0.021	<0.010	<0.021	<0.10	<0.021
South Mesquite Creek	SMC-A	3/19/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		7/16/2019	<0.19	<0.049	<0.019	<0.0097	<0.019	<0.097	<0.019
	SMC-B	4/2/2019	< 0.19	< 0.049	< 0.019	< 0.0097	< 0.019	< 0.097	< 0.019
		7/18/2019	<0.20	<0.050	<0.020	<0.0099	<0.020	<0.099	<0.020
	SMC-C	4/11/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		7/18/2019	<0.19	<0.049	<0.019	<0.0097	<0.019	<0.097	<0.019
Turtle Creek - Trinity River	CEDR-1	4/3/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		8/1/2019	<0.19	<0.049	<0.019	<0.0097	<0.019	<0.097	<0.019
		8/1/2019	<0.20	<0.050	<0.020	<0.0099	<0.020	<0.099	<0.020
	COO-A	4/2/2019	< 0.19	< 0.049	< 0.019	< 0.0097	< 0.019	< 0.097	< 0.019
		7/18/2019	<0.19	<0.049	<0.019	<0.0097	<0.019	<0.097	<0.019
White Rock Creek - White Rock Lake	DIX-A	3/19/2019	< 0.20	< 0.050	< 0.020	< 0.010	< 0.020	< 0.10	< 0.020
		7/16/2019	<0.19	<0.049	<0.019	<0.0097	<0.019	<0.097	<0.019

Table B-5e Water Quality Data (Pesticides 3)

HUC Watershed	Sample ID	Collection Date	Endrin aldehyde (µg/L)	G-BHC (Lindane) (µg/L)	Heptachlor (µg/L)	Heptachlor epoxide (µg/L)	Simazine (µg/L)	Methoxychlore (µg/L)	Toxaphene (µg/L)
Bachman Branch - Elm Fork Trinity River	JOES-1	4/3/2019	< 0.10	< 0.051	< 0.010	< 0.010	< 0.17 *	< 2.0	< 0.30
		8/1/2019	<0.097	<0.049	<0.0097	<0.0097	<0.17	<1.9	<0.29
	BAB-B	3/18/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17	< 2.0	< 0.30
		7/16/2019	<0.099	<0.050	<0.0099	<0.0099	<0.07	<2.0	<0.30
	NWDA-1	4/3/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17 *	< 2.0	< 0.30
		8/1/2019	<0.098	<0.049	<0.0098	<0.0098	<0.17	<2.0	<0.29
	RIB-A	4/11/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.07	< 2.0	< 0.30
		7/18/2019	<0.098	<0.049	<0.0098	<0.0098	<0.07	<2.0	<0.29
Delaware Creek - West Fork Trinity	MOC-A	3/20/2019	< 0.099	< 0.050	< 0.0099	< 0.0099	< 0.17	< 2.0	< 0.30
		7/10/2019	<0.096	<0.048	<0.0096	<0.0096	0.17	<1.9	<0.29
Farmer's Branch - Elm Fork Trinity	FARM-1	4/3/2019	< 0.10	< 0.050	< 0.010	< 0.010	2.4 *	< 2.0	< 0.30
		8/1/2019	<0.097	<0.049	<0.0097	<0.0097	<0.17	<1.9	<0.29
Five Mile Creek – Trinity River	FIV-A	3/19/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17	< 2.0	< 0.30
		7/15/2019	Lab did not run samples due to login error				<0.07	Lab error – did not run samples	
		7/15/2019					<0.07		
	FIV-B	3/19/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.18	< 2.0	< 0.30
		3/19/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17	< 2.0	< 0.30
		7/15/2019	Lab did not run samples due to login error				<0.07	Lab error – did not run samples	
	NEW-A	3/20/2019	< 0.010	< 0.050	< 0.010	< 0.010	< 0.17	< 2.0	< 0.30
		7/10/2019	<0.097	<0.049	<0.0097	<0.0097	<0.07	<1.9	<0.29
		7/10/2019	<0.10	<0.051	<0.010	<0.010	<0.07	<2.0	<0.30
	SEDA-1	4/3/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17 *	< 2.0	< 0.30
		4/3/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17 *	< 2.0	< 0.30
		8/1/2019	<0.098	<0.049	<0.0098	<0.0098	<0.17	<2.0	<0.29
Floyd Branch - White Rock Creek	FLO-A	3/21/2019	< 0.099	< 0.050	< 0.0099	< 0.0099	< 0.17	< 2.0	< 0.30
		7/8/2019	<0.10	<0.052	<0.010	<0.010	<0.07	<2.1	<0.31
	MCK-C	3/18/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17	< 2.0	< 0.30
		7/16/2019	<0.10	<0.051	<0.010	<0.010	<0.07	<2.0	<0.30
Headwaters Five Mile Creek	FIV-D	3/21/2019	< 0.099	< 0.050	< 0.0099	< 0.0099	< 0.17	< 2.0	< 0.30
		7/8/2019	<0.097	<0.049	<0.0097	<0.0097	<0.07	<1.9	<0.29

Table B-5e Water Quality Data (Pesticides 3)

HUC Watershed	Sample ID	Collection Date	Endrin aldehyde (µg/L)	G-BHC (Lindane) (µg/L)	Heptachlor (µg/L)	Heptachlor epoxide (µg/L)	Simazine (µg/L)	Methoxychlore (µg/L)	Toxaphene (µg/L)
Headwaters Ten Mile Creek	TEN-B	3/20/2019	< 0.099	< 0.050	< 0.0099	< 0.0099	< 0.17	< 2.0	< 0.30
		3/20/2019	< 0.099	< 0.050	< 0.0099	< 0.0099	< 0.17	< 2.0	< 0.30
		7/10/2019	<0.096	<0.048	<0.0096	<0.0096	<0.07	<1.9	<0.29
	TEN-D	3/21/2019	< 0.099	< 0.050	< 0.0099	< 0.0099	< 0.17	< 2.0	< 0.30
		7/8/2019	<0.097	<0.049	<0.0097	<0.0097	<0.07	<1.9	<0.29
Headwaters Turtle Creek	CEB-B	3/18/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17	< 2.0	< 0.30
		7/15/2019	Lab did not run samples due to login error				<0.07	Lab error	
	KNI-A	3/18/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17	< 2.0	< 0.30
		7/15/2019	Lab did not run samples due to login error				<0.07	Lab error	
	TRO-A	4/2/2019	< 0.097	< 0.049	< 0.0097	< 0.0097	< 0.17	< 1.9	< 0.29
		7/18/2019	<0.098	<0.049	<0.0098	<0.0098	<0.07	<2.0	<0.29
	TUR-A	4/11/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.07	< 2.0	< 0.30
		7/18/2019	<0.098	<0.049	<0.0098	<0.0098	<0.07	<2.0	<0.29
Prairie Creek - Trinity River	PRA-A	3/20/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17	< 2.0	< 0.30
		7/10/2019	<0.10	<0.052	<0.010	<0.010	<0.07	<2.1	<0.31
South Mesquite Creek	SMC-A	3/19/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17	< 2.0	< 0.30
		7/16/2019	<0.097	<0.049	<0.0097	<0.0097	<0.07	<1.9	<0.29
	SMC-B	4/2/2019	< 0.097	< 0.049	< 0.0097	< 0.0097	< 0.17	< 1.9	< 0.29
		7/18/2019	<0.099	<0.050	<0.0099	<0.0099	<0.07	<2.0	<0.30
	SMC-C	4/11/2019	< 0.10	< 0.050	< 0.010	< 0.010	0.07	< 2.0	< 0.30
		7/18/2019	<0.097	<0.049	<0.0097	<0.0097	<0.07	<1.9	<0.29
Turtle Creek - Trinity River	CEDR-1	4/3/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17 *	< 2.0	< 0.31
		8/1/2019	<0.097	<0.049	<0.0097	<0.0097	<0.17	<1.9	<0.29
		8/1/2019	<0.099	<0.050	<0.0099	<0.0099	<0.17	<2.0	<0.30
	COO-A	4/2/2019	< 0.097	< 0.049	< 0.0097	< 0.0097	< 0.17	< 1.9	< 0.29
		7/18/2019	<0.097	<0.049	<0.0097	<0.0097	<0.07	<1.9	<0.29
White Rock Creek - White Rock Lake	DIX-A	3/19/2019	< 0.10	< 0.050	< 0.010	< 0.010	< 0.17	< 2.0	< 0.30
		7/16/2019	<0.097	<0.049	<0.0097	<0.0097	<0.07	<1.9	<0.29

Note:

- Sample extracted and analyzed outside EPA method hold time.

Analyte recovery in the Laboratory Control Sample was above QC limits. Results for this analyte in these samples may be biased high.

Appendix I:

Fort Worth Bioassessment Report

Regional Participants:

City of Arlington

City of Dallas

City of Fort Worth

City of Garland

City of Irving

City of Mesquite

City of Plano

North Texas Tollway
Authority (NTTA)

Dallas - Fort Worth
Regional Wet Weather
Characterization Program

Monitoring Plan

TPDES Permit No. WQ0004350000

City of Fort Worth

September 2018

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1. OVERVIEW

1.1 Goals

The goal of the Regional Wet Weather Characterization Program (RWWCP) is to assess receiving water quality and direct resources towards local pollutants of concern. Other possible beneficial uses of the monitoring data include: (1) assessing the chemical, physical, and biological impacts to receiving waters resulting from urban runoff; (2) assessing the overall health and evaluating long-term trends in receiving water quality; (3) measuring and improving the effectiveness of the Best Management Practices (BMPs); and (4) identifying pollutant sources.

1.2 Summary of Program

From 1996-2001, the City of Fort Worth along with the other seven regional participants conducted storm water characterization through wet weather monitoring at storm drain outfalls as directed by the City's original National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit issued by the U.S. Environmental Protection Agency (USEPA). The monitored outfalls represented primarily single land use watersheds although a few multi-land use outfalls and in-stream locations were included.

In the second permit term the emphasis of the Regional Wet Weather Characterization Program (RWWCP) shifted from outfall monitoring of storm water characteristics to in-stream monitoring of storm water effects. The primary goal of in-stream monitoring was to obtain baseline data on receiving streams for use in determining long-term water quality trends. The program's initial five year implementation plan began on December 22, 2005 with the issuance of the City of Garland Phase I Texas Pollutant Discharge Elimination System (TPDES) MS4 permit. The RWWCP plan, approved by the Texas Commission on Environmental Quality (TCEQ) on April 15, 2003, included chemical monitoring with a biological monitoring option that was adopted by the City of Fort Worth. Following completion of the first five year term, final analysis of regional data indicated that more data is needed to determine trends.

The third permit term continued in-stream watershed monitoring and increased coverage of the watersheds to at least 50% of the jurisdictional areas. The plan was approved by the TCEQ on February 11, 2011. The primary goal of the plan during this permit term was to continue the assessment of urban impact on receiving stream water quality and to document any improvement presumable resulting from local BMP implementation.

The current permit was approved on March 8, 2018 and the fourth permit term will continue in-stream monitoring to document water quality improvements in impaired watersheds and monitor BMP effectiveness. Watershed coverage within each jurisdiction will be at a minimum of 50% and where possible, include impaired stream segments. The data collected during this permit term will further enhance the long-term trend analysis of the area.

Chemical Monitoring: The City of Fort Worth plan differs from the standard regional protocol in this component. The standard regional protocol calls for four collection events each year (quarterly) during years one through four from a single receiving stream during rain events. The City of Fort Worth TPDES Permit No. WQ0004350000 (Part IV.A.2(b)) allows this chemical sampling frequency to be reduced from four times per permit term (quarterly during one year) to once per permit term when the bioassessment option is implemented. Fort Worth has committed to collecting samples at two locations within a receiving stream during each of the five years of the five-year program. A total of four RWWCP samples will be collected each calendar year from two different watersheds with a total of 20 samples collected over the permit term. Site selection was determined utilizing U.S. Geological Survey (USGS) HUC-12 watersheds where approximately 54% of the Fort Worth jurisdictional area (185 square miles) will be monitored throughout the fourth term.

An upstream and downstream site on two different receiving streams that flow through the City will be sampled each year in years one through three. When possible, an ambient (low flow, no precipitation) sample will be collected at the downstream site on each of the monitored receiving streams during the sample year. Following completion of sampling in year three, locations for years four and five will be selected from sites sampled in years one through three. Additional sampling at selected locations will be determined based on assessment of the chemical, physical, and biological impacts to the receiving waters. The objectives of this component are to assess changes that these receiving streams may undergo as they pass through the urban area, to evaluate long-term trends in receiving water quality and to concentrate on those watersheds which indicate a greater impact from storm water runoff.

Biological Monitoring: This component, which includes bioassessments using habitat assessment, evaluation of selected physical and chemical water quality parameters and benthic macroinvertebrate collection, seeks to evaluate the biological impact of urban runoff on receiving water and assess the overall health of the receiving water. Biological testing was selected because it has the potential to detect effects of all toxicants, including those that may not be selected for chemical analysis. Bioassessments will be conducted at two monitoring locations on each selected stream twice per year. As resources allow, a third site on each stream may also be evaluated and fish communities may be added to the assessment. Due to accessibility issues and automatic sampler installation requirements, bioassessment monitoring sites may not be co-located with chemical monitoring stations. Because samples are collected from at least two bioassessment monitoring locations each year of the program, potential problem areas or new pollutant sources may be more readily detected than with chemical sampling alone.

2. SAMPLE SITE DESCRIPTIONS

Six watersheds were selected for sampling during this permit term to ensure monitoring covers >50% of the City of Fort Worth's jurisdiction: Marine Creek-West Fork Trinity River, Lake Como-Clear Fork Trinity River, Sycamore Creek-West Fork Trinity River, Whites' Branch-Big Fossil Creek, Headwaters Sycamore Creek, and Mary's Creek. Within each watershed, respectively, a primary receiving stream was selected for monitoring: Marine Creek in northwest Fort Worth, an unnamed tributary of the Clear Fork Trinity River that passes through Overton Park in southwest Fort Worth, Little Fossil Creek and Big Fossil Creek in north Fort Worth, Sycamore Creek in the south-central part of the city and Mary's Creek to the west. Watershed maps for each receiving stream are included as Appendix II. Table 2-1 provides a summary of sampling locations.

Table 2-1 Location summaries for Fort Worth sites to be monitored during the fourth term Dallas-Fort Worth RWWCP

HUC-12 Watershed	Site ID	Biological (B)/ Chemical (C) Station	Location Description	Latitude	Longitude
Marine Creek- West Fork Trinity River	MAR1	C	3500 Macie, bridge crossing in Buck Sansom Park	32.8079	-97.3703
	MAR1	B	West of Angle Avenue in Buck Sansom Park	32.8069	-97.3691
	MAR2	B	Lincoln Park, north of 28th St crossing	32.7955	-97.3572
	MAR3	B/C	Saunders Park south of Mule Alley and downstream of JV1A	32.7862	-97.3460
Lake Como – Clear Fork Trinity River (Unnamed Tributary in Overton Park)	OVR1	C	Across from 4413 Trail Lake in Foster Park	32.6823	-97.3739
	OVR1	B	NW of Granbury Rd and Trail Lake Dr	32.6820	-97.3738
	OVR2	B	East of 3808 Overton Park West, near Tanbark Trail intersection	32.6925	-97.3831
	OVR3	C	4600 Bellaire Dr S. west of Hulen St.	32.7040	-97.3920
	OVR3	B	Overton Park West south of intersection with Bellaire	32.7017	-97.3839
Sycamore Creek – West Fork Trinity River (Little Fossil Creek)	LFC1	B/C	2200 block Cantrell Sansom	32.8478	-97.3297
	LFC2	B	100 yards west of and upstream of I-35W crossing	32.8279	-97.3146
	LFC3	B/C	Dead end of Mesquite Rd. south of 3800 Long Ave.	32.8095	-97.2909
White's Branch -Big Fossil Creek	BFC1	C	7764 N Blue Mound Road	32.8906	-97.3464
	BFC1	B	West of and parallel to Pepperidge Lane	32.8854	-97.3421
	BFC2	B	I-35W crossing, north of Western Center Blvd	32.8625	-97.3142
	BFC3	B/C	N. Beach St. north of Paula Ridge	32.8536	-97.2904
Headwaters Sycamore Creek	SYC1	B/C	I-35W northbound frontage road beneath SE Loop IH-820 eastbound	32.6677	-97.3178
	SYC2	B	Cobb Park West south of US-287 at low water crossing	32.7217	-97.2935
	SYC3	B/C	Dead end of Scott St. west of Beach St.	32.7475	-97.2949
Mary's Creek	MRY1	B/C	3900 block Longvue (FM 2871)	32.7133	-97.4966
	MRY2	B	Loop IH-820 SW crossing, 0.5 mile south of Chapin Rd	32.7117	-97.4767
	MRY3	B/C	Winscott Road (Vickery Blvd.) in South Z Boaz Park	32.6954	-97.4477

Bioassessments will be performed on two sites on each monitored stream with a third site added as resources allow. Sites assessed using bioassessment on each stream may vary depending on local conditions.

Marine Creek originates in northwest Fort Worth and flows south for approximately 3 miles before it joins with an unnamed tributary to form Marine Creek Lake. Marine Creek Lake, which is owned and operated by the Tarrant Regional Water District (TRWD), is located northwest of IH-820 between the cities of Lake Worth and Saginaw. From the containment dam on the south side of Marine Creek Lake, Marine Creek flows southeast through northwest Fort Worth until it enters the West Fork Trinity River near Samuels Ave. The Marine Creek – West Fork Trinity River watershed includes approximately 12,400-acres with land uses including 55% residential, 16% industrial, 8% parks, 6% institutional, 6% mixed use, 4% commercial, 3% lakes and ponds, 2% infrastructure, and 1% agriculture. The upstream chemical monitoring sample location on Marine Creek (MAR1) is located at the Macie Ave. bridge crossing in Buck Sansom Park. The MAR1 biological site is downstream of the chemical station and west of Angle Avenue in Buck Sansom Park. Marine Creek meanders through undeveloped land and a city park below MAR1. The middle reach bioassessment site (MAR2) is located north of the NW 28th St. bridge in Lincoln Park. Surrounding watershed influences above MAR2 include single-family residential and runoff from Meacham International Airport. Potential commercial impacts, including the Fort Worth Stockyards National Historic District increase in the lower reach (MAR3). MAR3 is accessed through Saunders Park on the south end of the Fort Worth Stockyards and north of the NE 23rd St. bridge crossing. MAR3 is to be used as both a chemical and biological monitoring site. From MAR3 to the confluence with the West Fork Trinity River, Marine Creek flows approximately 0.45 mile southeast.

Lake Como-Clear Fork Trinity River Watershed. An unnamed tributary to the Clear Fork Trinity River, the primary receiving water in this watershed, begins at the 72" storm drain outfall identified as FUL1 in Kellis Park. The unnamed creek flows northwest to its confluence with the Clear Fork Trinity River approximately 0.25 mile west of the Hulen St./Bellaire Dr. S. intersection, midway between SW Loop IH-820 and I-30. The unnamed tributary is fully encompassed inside the city limits of Fort Worth. Land use within this approximately 3,000-acre watershed can be described as 78% residential, 8% mixed use, 5% institutional, 4% parks, 3% commercial, 1% industrial, and <1% infrastructure and lakes/ponds.

For biological monitoring, the selected upstream site (OVR1) is located on an unnamed tributary to the Clear Fork Trinity River northwest of the Granbury Rd intersection with Trail Lake Dr. The chemical monitoring site at OVR1 is located across from 4413 Trail Lake Drive in Foster Park on a pedestrian bridge. This site was changed slightly from the third permit term due to flow concerns. The previous location was downstream of a pond, which caused a slowed flow response at the site. The new site is located upstream of the pond and should capture true stream flow characteristics. The watershed upstream of these locations is residential with a mix of commercial and park land uses. Below the upstream reach, the receiving water is subjected to loading from single-family residential and park land uses as it passes through two city parks. The middle reach bioassessment site OVR2 is located along the unnamed tributary east of 3808 Overton Park West, approximately 100 yards downstream of the confluence of the creek with another unnamed tributary flowing in from the west. A combination of commercial, residential and park land uses continues as the stream flows north and west to site OVR3. The downstream biological monitoring site (OVR3) is located along Overton Park West south of the intersection with Bellaire Dr. OVR3 as designated for chemical monitoring is located further downstream in a gabion-lined channel below the Bellaire Dr. S. bridge crossing. The confluence of the unnamed tributary and the Clear Fork Trinity River is approximately 0.15 mile downstream of this location.

White's Branch - Big Fossil Creek. Big Fossil Creek, the primary receiving stream in this watershed, begins in northwest Tarrant County and flows southeast through north Fort Worth between the cities of Haslet and Saginaw. The lower portion of this watershed includes the Phase II cities of Haltom City, North Richland Hills, and Richland Hills. Big Fossil Creek joins with Little Fossil Creek approximately 0.5 mile north of the West Fork Trinity River and 0.75 mile south of SH-121 where it continues to flow southeast to its confluence with the West Fork Trinity River north of RiverBend Estates in east Fort Worth. The White's Branch – Big Fossil Creek Watershed drains approximately 20,000-acres whose makeup is 60% residential, 12% industrial, 12% commercial, 7% mixed use, 7% parks, and 2% institutional.

The upstream chemical monitoring station on Big Fossil Creek (BFC1) is located at 7764 N Blue Mound Rd just north of the Northwest Community Park (Fort Worth operated). This site was relocated during this permit term to due to safety concerns of the previous site and to ensure the main stem of Big Fossil Creek was monitored. Much of the watershed upstream of this site is rural, undeveloped or residential in nature. The upper reach biological monitoring site BFC1 is located downstream of the chemical site, west of and parallel to Pepperidge Ln. Downstream of this point is a fully developed residential area followed by active agricultural/ranching lands and mixed urban land use. The middle reach bioassessment site, BFC2, is located north of Western Center Blvd at the I-35W crossing. Below BFC2, the watershed is fully developed with land uses including residential, commercial, and industrial. The selected lower reach monitoring site (BFC3) will be used for both chemical and biological assessment. BFC3 is located at the Beach St. crossing north of Paula Ridge. Below this point, the creek flows through Haltom City, North Richland Hills and Richland Hills before converging with Little Fossil Creek and the West Fork Trinity River.

Sycamore Creek – West Fork Trinity River. Little Fossil Creek is the primary receiving stream for the Sycamore Creek – West Fork Trinity River watershed. Initial/baseline chemical sampling for this watershed will take place in Year 2 of the permit term (2013). Land use within the approximately 7,500-acre drainage basin is comprised of 85% industrial, 10% residential, 3% commercial, 1% infrastructure, and 1% institutional. Little Fossil Creek begins in the City of

Saginaw and flows southeast through the cities of Saginaw and Blue Mound before it enters the jurisdictional boundary of Fort Worth, approximately 0.25 mile north of NE Loop IH-820 and 1.0 mile west of I-35W. Little Fossil Creek continues southeast for several miles through Fort Worth and Haltom City where it eventually joins with Big Fossil Creek approximately 0.5 mile north of the West Fork Trinity River and 0.75 mile south of SH-121.

The upstream sample site on Little Fossil Creek in the Sycamore Creek – West Fork Trinity River Watershed (LFC1) is located in the 2200 block of Cantrell Sansom Rd. at a bridge crossing approximately 0.25 mile north of NE Loop IH-820 and 1.0 mile west of I-35W. This location is designated for both chemical and biological assessment. The watershed upstream of this location is a mix of industrial, commercial and residential land uses in the cities of Saginaw and Blue Mound. Downstream of LFC1, Little Fossil Creek flows through an area of primarily light industrial, commercial and undeveloped land use. The middle biological monitoring site (LFC2) is located approximately 100 yards upstream and on the west side of the I-35W bridge crossing. Between the middle site, LFC2, and the most downstream site, LFC3, land use is primarily industrial. The downstream monitoring station (LFC3) is located at the northern dead end of Mesquite Rd. south of 3800 Long Ave. and will be used for both chemical and biological assessment. Little Fossil Creek flows from this point through residential areas of Haltom City to its confluence with Big Fossil Creek and then southeast to the West Fork Trinity River.

Headwaters Sycamore Creek Watershed. Sycamore Creek is the primary receiving water within the Headwaters Sycamore Creek Watershed. Sycamore Creek begins in south Fort Worth and flows to the northeast through the south central part of the city. The Headwaters Sycamore Creek watershed drains approximately 24,000 acres whose makeup includes 57% residential, 12% institutional, 9% commercial, 9% parks, 8% industrial, 4% mixed use, and 1% infrastructure. The confluence of Sycamore Creek and the West Fork Trinity River is located approximately 1.5 miles east of I-35W, 0.25 mile north of I-30 and 0.25 mile west of Beach St.

The upstream sample site on Sycamore Creek (SYC1) is located below the overpasses at the intersection of SE Loop IH-820 and I-35W approximately 0.75 mile north of Altamesa Blvd. SYC1 will be monitored through chemical sampling/analysis as well as biological assessment. The watershed upstream of this location is a mix of residential, light commercial and industrial land uses. Downstream of SYC1, Sycamore Creek flows through an area of residential, commercial, industrial and park land uses. The middle reach biological assessment site (SYC2) is located in Cobb Park south of US-287. Below SYC2, the watershed is developed with a mix of residential, commercial, and industrial land uses. The downstream sample station (SYC3) is located approximately 0.40 mile west of Beach St. at the western dead end of Scott St. SYC3 is designated as both a chemical and biological monitoring location. Sycamore Creek flows from this point approximately 0.25 mile north to its confluence with the Trinity River.

Mary's Creek is located in west Tarrant County with headwaters originating in east Parker County. Land use within its approximately 35,000-acre watershed is comprised of 71% residential, 11% agricultural, 8% commercial, 3% industrial, 3% parks, 2% infrastructure, 2% mixed use, 1% institutional, and <1% lakes/ponds. The majority of agricultural land use in the watershed is located in the upper portion. On-going residential growth in the area is expected to continue in addition to development related to proposed construction of a water reclamation plant which will discharge to Mary's Creek. Mary's Creek converges with the Clear Fork Trinity River approximately 0.25 mile west of SH-183 (Southwest Blvd.) and 0.80 mile north of I-20.

The uppermost monitoring site on Mary's Creek (MRY1) is located just downstream of the bridge crossing at 3900 Longvue (FM 2871), approximately 1.0 mile west of West Loop IH-820. This location will be used for both chemical and biological monitoring and is currently designated as the reference site for biological monitoring. Undeveloped and recently developed residential land uses dominate the watershed upstream between this location and I-30. Immediately downstream of this location is a primarily undeveloped area with on-going residential development to the south. The middle reach bioassessment site (MRY2) is located at the bridge crossing of West Loop IH-820, approximately 0.5 mile south of Chapin Rd. A combination of commercial, residential and park land uses is evident below MRY2 as the creek passes through the City of Benbrook. The lower monitoring station (MRY3) will be utilized for both chemical and biological assessment. MRY3 is located approximately 0.10 mile upstream of the Winscott Road crossing in South Z Boaz Park. Biological assessment occurs just downstream of the bridge crossing. Below this point, the creek continues through the City of Benbrook and a private golf course prior to its convergence with the Clear Fork Trinity River.

3. CHEMICAL MONITORING COMPONENT

Chemical sampling of receiving water provides a snapshot of the creek at the moment the sample is taken. The timing of sample collection determines, to some extent, what may be present in the sample. The monitoring program is designed to collect storm water samples when water quality is at its worst. Parameters to be monitored during this program are listed in Table 3-1.

Table 3-1 Physico-chemical constituents to be monitored during the Dallas-Fort Worth Regional Wet Weather Characterization Program fourth term

Parameter	Method	LOQ	Sample Type
O&G	EPA 1664A	5.00 mg/L	Grab
pH*	EPA 150.1	----	Grab
TDS	SM 2540 C	<20.0 mg/L	Composite
TSS	SM 2540 D	2.00 mg/L	Composite
BOD	SM 5210 B	<2.00 mg/L	Composite
COD	HACH 8000	30 mg/L	Composite
Total Nitrogen	Calculated		Composite
Dissolved Phosphorus	Contract Lab		Composite
Total Phosphorus	EPA 365.4	1.0 mg/L	Composite
Atrazine	EPA 525	1.0 ug/L	Composite
Total Arsenic	EPA 200.8	0.50 ug/L	Composite
Total Chromium	EPA 200.8	3.00 ug/L	Composite
Total Copper	EPA 200.8	2.00 ug/L	Composite
Total Lead	EPA 200.8	0.50 ug/L	Composite
Total Zinc	EPA 200.8	5.00 ug/L	Composite
Ammonia Nitrogen	HACH 8038	0.10 mg/L	Composite
Nitrate Nitrogen	EPA 300.0	0.10 mg/L	Composite
Orthophosphate	EPA 300.0	0.10 mg/L	Composite
E. coli	SM 9223 B	1 MPN/100mL	Grab

*Measured/analyzed by City of Fort Worth. All other parameters to be analyzed by contract laboratory.

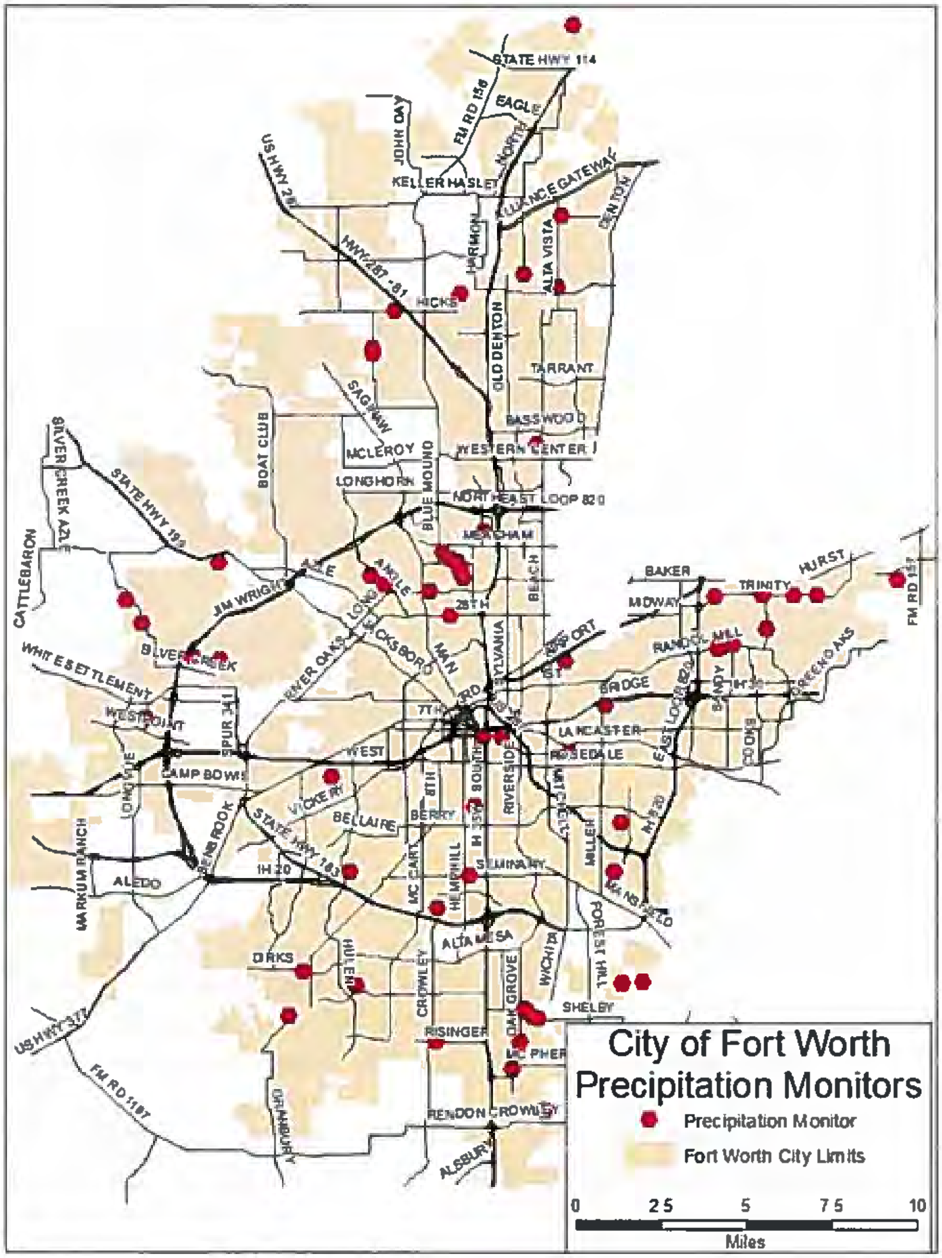
3.1 Representative Storm Events

During the first permit term characterization program (September 1996 – August 2001) a storm qualified as "representative" if the rainfall depth was between 0.20 and 1.5 inches with no storm events in excess of 0.10 inch in the drainage area for at least 72 hours prior to the sampled storm. Automatic samplers for composite samples were triggered when a rain gauge located at the site registered 0.10 inch of rain and manual grab samples were collected within the first hour of the event.

The in-stream sample locations used during this permit term are typically located in much larger watersheds than the drainage basins for the outfalls sampled during the first term. It is more likely that a rain event in the upper portion of the watershed could result in a storm discharge at the sample location without rainfall being registered at the collection site. A sampled storm event will be preceded by a minimum 72-hour antecedent dry period wherein no greater than 0.10 inch of rainfall has occurred. This dry period allows build-up of constituents on the ground surface that can be washed off by the next storm event.

Rainfall volume is the total amount of rainfall in inches within the contributing watershed of a monitoring station. While rainfall volume will not be used to qualify a storm event during the fourth permit term, rain gauges can be deployed to support assessment of local wet weather conditions. Additionally, the City of Fort Worth operates multiple rain gauges throughout the City (see Figure 3-1). These gauges will send out an alert for a qualifying rain event, typically 0.1 in of rain within a 30 min time period, allowing staff to monitor the area for qualifying rain events. Sampling will be triggered based on a rise in water level rather than by rainfall. The grab sample and the first composite aliquot will be collected by the automatic samplers during the "first flush" which is defined as the 30-minute period following a 1.0 inch rise in the receiving stream level. The amount of water level rise that will trigger an event will initially be set at 1.0 inch for all sample locations; experience during the program term may dictate changes in this level for some or all locations.

Figure 3-1: Precipitation monitors located with the City of Fort Worth



3.2 Sampling Strategy

Because the City of Fort Worth has opted to include a bioassessment component in its characterization monitoring plan, the City's MS4 permit requires the collection of one storm event sample per year from four locations (two sites each within two different receiving streams) during years one through five of the five-year program for the chemical component. Samples for 2018 will be collected in the Headwaters Sycamore Creek and Mary's Creek watersheds. Marine Creek – West Fork Trinity River and Lake Como – Clear Fork Trinity River watersheds will be sampled in 2019 followed by Sycamore Creek – West Fork Trinity River (Little Fossil Creek) and White's Branch – Big Fossil Creek in 2020. Additional chemical monitoring will be performed during 2021 and 2022 from previously sampled locations. Watershed and site selection for those years will be determined following completion of Year 3 (2020) and based on assessment of the chemical, physical, and biological impacts to the receiving waters during 2018-2020 monitoring.

A minimum of four RWWCP samples will be collected each calendar year by the City of Fort Worth resulting in at least 20 chemical monitoring samples for the permit term. The bioassessment component (Section 4) will add assessment of at least 120 macroinvertebrate samples for a minimum total program effort of 140 samples.

3.3 Sampling Methodology

Weather Tracking: The National Weather Service (NWS) collects and processes satellite imagery and other atmospheric data, and runs major weather forecast models. This information is available on the NWS website, http://www.nws.noaa.gov. The satellite imagery and radar images from this or other available sources such as local television stations (e.g. http://www.wfaa.com/weather) will be used to predict when a qualifying storm may occur. City staff will use this information to deploy sampling equipment prior to the approaching rain event. After an event is sampled, radar imagery and/or rain gauge data will be used to characterize the duration, intensity, and volume of the rain event.

Sample Collection: Prior to the rain event, automatic water samplers (ISCO 3700 or other) will be deployed at the site(s) to be monitored. The samplers will be programmed to initiate sampling at a 1.0 inch rise in receiving stream water level. Upon activation, the sampler will collect a "first flush" grab sample and the first of four sub-samples for a time-weighted composite sample. Subsequent sub-samples will be collected at 30-minute intervals.

Where available, a wireless data transceiver will alert the field crew when the sampler is activated. Upon notification, assigned personnel will travel to the site(s) and if conditions permit, collect two manual grab samples; one for bacteria analysis and another for oil and grease. If conditions in the field do not allow for safe and timely collection of the manual grab samples, the grab sample collected by the automatic sampler will be used for these analyses.

3.4 Sample Analysis

Methods for sample analysis will be in accordance with 40 CFR Part 136. Alternate test methods may be substituted providing that the methods are EPA-approved, have at least the same precision, and detect constituents at levels no higher than the methods prescribed in 40 CFR 136. All samples will be submitted to the City of Fort Worth Water Department Centralized Water and Wastewater Laboratory (NELAC-approved) or other contracted NELAC-approved laboratory for analysis. Chain of custody documentation shall be maintained for all samples.

4. BIOASSESSMENT COMPONENT

The City of Fort Worth has opted to include bioassessment in its representative monitoring program. The status of biological communities reflects the integrity of the system as a whole, and takes physical and chemical characteristics into account. Bioassessment is used to assess overall stream health and incorporates long term water quality into what is present or absent in the biological community.

Benthic macroinvertebrates will be collected based on procedures in TCEQ's *Surface Water Quality Monitoring Procedures, Volume 2* [1] guidance document using a D-frame net in riffle habitat. If riffle habitat is not present at the site, samples may be collected from run/glide areas, or other available habitat. Sample collection methods may be modified as needed depending on stream conditions. Bioassessment data will be analyzed following methods for kicknet or snag samples as in the TCEQ guidance document, which uses metrics which provide a score for each site. Each site score is assigned an aquatic life use value based on the overall score compared to values in the appropriate TCEQ table. The values in the TCEQ table are derived data collected at TCEQ reference sites. Bioassessments will also include habitat assessment and evaluation of selected physical and chemical water quality parameters.As resources allow, fish community information will also be collected at the lowest site on each stream using electrofishing, and seines as needed. Fish data will be analyzed following procedures referred to in the TCEQ guidance document and as found in Texas

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[1] TCEQ, revised May 2014. *Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data*. TCEQ RG-416. May 2014.

Parks and Wildlife's Regionalization of the Index of Biotic Integrity for Texas Streams[2] .

4.1 Sampling Strategy

Bioassessments will be conducted on at least two sample sites on each of the six monitored streams twice per year during each year of the permit term. As resources allow, a third site will be added and assessed. Sampling will be performed in late spring/early summer (May/June) and fall (October/November). An approximately 100 meter reach will be used for bioassessment collections. Biological monitoring sites may be located separate from chemical monitoring stations in order to include appropriate habitat and ensure biological collections occur at appropriate depth regimes. As previously stated, if suitable riffle habitat is not available for collection of macroinvertebrates, other habitat may be sampled, and other collection means may be used. The upstream sample site on Mary's Creek (MRY1) has been established as a reference site based on previous analysis. Other locations may also be established as reference sites as needed. City of Fort Worth bioassessment procedures follow those described in TCEQ's *Surface Water Quality Monitoring Procedures, Volume 2*[3]and USEPA *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers, Second Edition*[4].

4.2 Habitat Assessment

Habitat assessment is an integral component of bioassessment as it aids in the interpretation of differences in community composition and provides characterization of the ability of a stream to support aquatic life. Physical stream habitat characteristics such as surrounding land use, amount of stream side riparian cover, channel alteration, and substrate characteristics can strongly affect the benthic macroinvertebrate community assemblage. When physical habitat is similar between the reference site and sample site, water quality parameters are considered when determining stress causation to biological communities.

Habitat assessments were performed at each site following guidelines for high gradient streams in Chapter 5 of USEPA's Rapid Bioassessment Protocols. This assessment includes scoring 10 different habitat factors with available scores ranging from 0 to 20, with 0 representing poor conditions

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[2] Texas Parks and Wildlife, Resource Protection Division, *Regionalization of the Index of Biotic Integrity for Texas Streams*, River Studies Report No.17, June 2002.

[3] Ibid.

[4] Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition*. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

and 20 representing optimal habitat. Parameters evaluated in habitat assessments include bottom substrate and available cover suitability for colonization, embeddedness, flow regimes present, bottom scouring and sediment deposition, channel alteration, channel flow status, frequency of riffles or bends, stream bank stability, vegetative protection, and riparian vegetative zone width. Individual scores for these 10 factors are totaled to produce the overall habitat score.

4.3 Physical and Chemical Water Quality Characterization

In addition to the riparian and instream habitat assessment, other physical characteristics and water quality parameters are pertinent to the overall stream assessment. Several physical characteristics are collected and recorded, along with analyses of dissolved oxygen (DO), pH, specific conductance, turbidity, water temperature, nitrate-nitrogen, ammonia-nitrogen, and phosphate. Physical characterization sheets are included with the Habitat Assessment SOP in Appendix III. As resources allow, *Escherichia coli* (*E. coli*) bacteria sample collection and analysis will be included in water quality characterization during both spring and fall assessments at all biologically monitored sites. *E. coli* samples will be processed in-house by experienced storm water quality monitoring staff using approved Colilert® procedures and in accordance with the City of Fort Worth SOP LP-02: *E. coli Analysis-Colilert*.

4.4 Macroinvertebrate Collection

The benthic macroinvertebrate community is assessed using a single habitat sampling approach. Macroinvertebrate diversity and abundance are generally highest in cobble substrate (riffle/run) habitat (EPA, 1999). Samples are collected from riffle habitat using a D-frame kick net. The D-frame net is approximately 12"x10" at the mouth, and has a mesh size of $\leq$ 590 µm. One sample is collected from each sampling site, as per the City of Fort Worth SOP FP-08 *Collecting Benthic Macroinvertebrates using a D-frame net*. Collected samples are transferred from the D-frame net to sample containers and preserved in the field with either 95% ethanol or 100% isopropyl alcohol.

4.5 Laboratory Processing of Macroinvertebrate Samples

After collection and preservation, samples are returned to the laboratory for sorting and identification. Following TCEQ guidance for sorting kicknet samples, and the City of Fort Worth SOP LP-06: *Sorting Benthic Macroinvertebrate Samples Collected with a D-frame Net*, the samples are subsampled with an overall goal of picking 175 (±20%) organisms from the sample.

Most organisms are identified to family, except for Chironomidae (Subfamily), Turbellaria (Class), Hirudinea (Class), and Nematoda (Phylum). If organisms are easily identified to lower taxonomic level, this information may be recorded for future reference. As resources allow, routine identification to lower taxonomic levels will be considered. However, it is important to maintain a consistent level of identification for each taxon across samples when using biometric analysis.

4.6 Macroinvertebrate Data Analysis

The TCEQ macroinvertebrate Texas Index of Biotic Integrity (TX-IBI) is used for data analysis of macroinvertebrate data. The TX-IBI method uses a comparison to guidelines established by TCEQ regional reference site data to determine an aquatic life use rating for each site. The metric procedures used may change as methods are evaluated for applicability to this program.

The TX-IBI methodology is found in the TCEQ's *Surface Water Quality Monitoring Procedures, Volume 2*[5] and uses twelve macroinvertebrate community structural and functional metrics for assessment of biotic integrity. Biological metrics are calculated with the resulting macroinvertebrate identification data, an interim score is assigned to each individual metric, and the individual metric scores are summed to produce an overall score for each individual site. Scores generated at each site are compared to values in TCEQ guidelines to determine an aquatic life use rating. This method gives an individual value for each site based on comparison to TCEQ generated regional reference site data. Additionally, individual sites may be compared to themselves year to year on a seasonal basis (spring to spring and fall to fall) to demonstrate biological community changes within each reach.

4.7 Fish Collection

As resources allow, fish will be collected at the lowest stream site within each watershed during sampling events. Collection methods will include electrofishing, and seines as needed. Methods will follow Fort Worth SOP FP-09: *Fish Collections during Bioassessments*, which is based on methodology found in the TCEQ guidance document. Fish will be collected and placed in a bucket temporarily. Identifications will be made at each site of collection, and fish will be returned to the stream from which they were removed as quickly as possible. Fish that require further identification may be photographed, preserved and returned to the lab for identification.

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[5] Ibid.

4.8 Fish Data Analysis

Fish data will be analyzed using metrics referred to in the TCEQ guidance document, and fully detailed in Texas Parks and Wildlife's document *Regionalization of the Index of Biotic Integrity for Texas Streams*[6]. The method includes eleven individual structural and functional feeding group metrics which are assigned a score when compared to the calculated table values. The table values are derived from data collected from Texas state ecoregional reference sites. The individual metric scores are tallied to produce an overall score, which is assigned an aquatic life use based on the table's overall metric scores.

5. QUALITY ASSURANCE / QUALITY CONTROL

The City has developed SOPs for most field and laboratory activities to be undertaken during this project. Activities will be periodically monitored to assure conformance with available SOPs and consistency among staff. With some exceptions, biological methods do not lend themselves to the classical types of quality assurance used for chemical/physical methods.

6. REPORTING

The North Central Texas Council of Governments (NCTCOG) will coordinate the reporting effort for the RWWCP. All data collected by the City of Fort Worth as described herein along with any additional data collected to support this program will be submitted to the NCTCOG for inclusion in system-wide and region-wide reports produced annually. A copy of the regional reports will be included in the annual reports submitted to the TCEQ by the City of Fort Worth as required in the City's MS4 permit.

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[6] Ibid.

APPENDIX I:

NORTH CENTRAL TEXAS REGIONAL WET WEATHER CHARACTERIZATION PLAN PROPOSAL AND APPROVAL

APPENDIX II:

WATERSHED MAPS

Rapid Bioassessment Characterizations of Six Monitored Watersheds within the City of Fort Worth, Spring and Fall 2019.

Introduction

The City of Fort Worth's TPDES stormwater permit contains a monitoring component. To satisfy part of the monitoring requirements, Fort Worth participates in the Regional Wet Weather Characterization Program through the North Central Texas Council of Government (NCTCOG). Fort Worth's monitoring program includes performing rapid bioassessments on representative creeks within six watersheds twice per year, at a minimum of two sites per creek. The watersheds selected for monitoring include Mary's Creek, White's Branch-Big Fossil Creek, Headwaters Sycamore Creek, Marine Creek-West Fork Trinity River, Lake Como-Clear Fork Trinity River, and Sycamore Creek-West Fork Trinity River. On each monitored creek within the watershed, three sites were selected for sampling: an upper reach site (1), a mid-reach site (2), and a lower reach site (3) (Table 1). While sampling all three sites is preferred, conditions may occur where all three sites cannot be sampled. On most creeks, three sites were sampled during both spring (May) and fall (October) 2019. However, Sycamore Creek site 3 (SYC3) wasn't sampled during spring 2019 as it was unwadeable, and Marine Creek site 1 (MAR1) wasn't sampled during fall 2019 as it was dry.

Additional sites not included in the Regional monitoring plan were sampled during 2019. One site further upstream on Mary's Creek (MRY0), outside the City of Fort Worth's city limits and which doesn't receive discharge from the city's MS4 system, was sampled this year during both spring and fall 2019. One site within the Farmer's Branch watershed (FAR3), was sampled during spring but not during fall as it had been dry until the week of sampling. Additional sites within additional watersheds may be sampled in future years as resources allow.

Table 1: Bioassessment Sampling Site Names and Locations within seven Fort Worth Watersheds.

SITE NAME	LOCATION DESCRIPTION	STREAM NAME	HUC12 WATERSHED
MRY1	3900 block of Longvue crossing, FM 2871	Mary's Creek	Mary's Creek
MRY2	Loop IH-820 SW crossing, north of Team Ranch Rd	Mary's Creek	Mary's Creek
MRY3	At Winscott Road (Vickery Blvd.) crossing	Mary's Creek	Mary's Creek
BFC1	West of and parallel to Pepperidge Lane	Big Fossil Creek	White's Branch-Big Fossil Creek
BFC2	IH-35Wcrossing, north of Western Center Blvd	Big Fossil Creek	White's Branch-Big Fossil Creek
BFC3	Beach St. N crossing, north of Paula Ridge	Big Fossil Creek	White's Branch-Big Fossil Creek
SYC1	Intersection of IH-20 and IH-35W	Sycamore Creek	Headwaters Sycamore Creek
SYC2	Cobb Park West south of US-287 at low water crossing	Sycamore Creek	Headwaters Sycamore Creek
SYC3	End of Scott Avenue west of Beach Street	Sycamore Creek	Headwaters Sycamore Creek
MAR1	West of Angle Avenue in Buck Sansom Park	Marine Creek	Marine Creek-West Fork Trinity River
MAR2	Lincoln Park, north of 28th Street crossing	Marine Creek	Marine Creek-West Fork Trinity River
MAR3	Saunders Park north of NE 23rd, along Mule Alley	Marine Creek	Marine Creek-West Fork Trinity River
OVR1	NW of Granbury Rd and Trail Lake Dr intersection in Foster Park	Unnamed Tributary in Overton Park	Lake Como-Clear Fork Trinity River
OVR2	East of 3808 Overton Park West, near Tanbark Trail intersection	Unnamed Tributary in Overton Park	Lake Como-Clear Fork Trinity River
OVR3	Overton Park West south of intersection with Bellaire Dr. S	Unnamed Tributary in Overton Park	Lake Como-Clear Fork Trinity River
LFC1	2200 block Cantrell Sansom	Little Fossil Creek	Sycamore Creek-West Fork Trinity River
LFC2	upstream of IH35W crossing, south of Getsemani Baptist Church	Little Fossil Creek	Sycamore Creek-West Fork Trinity River
LFC3	West and southwest of Beach St. N and Long Ave. intersection	Little Fossil Creek	Sycamore Creek-West Fork Trinity River
MRY0+	Upstream (west side) of FM3325 crossing	Mary's Creek	Mary's Creek
FAR3^	North of the intersection of Chalk Knoll Rd and Willowick	Farmer's Branch	Farmer's Branch

+Potential new reference site, non-regulatory site

^ Non-regulatory site

Methods

Rapid bioassessment elements include evaluation of chemical and physical water quality parameters, habitat assessment, and sample collection and analysis of benthic aquatic macroinvertebrate communities. Sampling was conducted during spring (May) and fall (October) 2019.

Habitat Assessments and Physico-chemical Sampling

Habitat assessments were performed at each site following guidelines for high gradient streams in Chapter 5 of USEPA's *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers, Second Edition*[1]. This assessment includes scoring 10 different habitat factors with available scores ranging from 0 to 20, with 0 representing poor conditions and 20 representing optimal habitat. Parameters evaluated in habitat assessments include bottom substrate and available cover suitability for colonization, embeddedness, flow regimes present, bottom scouring and sediment deposition, channel alteration, channel flow status, frequency of riffles or bends, stream bank stability, vegetative protection, and riparian vegetative zone width. Individual scores for these 10 factors are totaled for the overall habitat score.

Physical and chemical parameters collected and analyzed with portable meters include pH, dissolved oxygen (D.O.), turbidity, specific conductance, and water and air temperature. Colorimetric test kits were used to analyze nutrient concentrations of ammonia-nitrogen, phosphate, and nitrate-nitrogen. *Escherichia coli* (*E. coli*) bacteria analysis was included at all monitored sites during both spring and fall 2019 sampling events. *E. coli* samples were processed in-house by experienced storm water quality monitoring staff using approved Colilert® procedures and in accordance with current City of Fort Worth Standard Operating Procedures (SOP). The physical characterization data sheet includes an estimated flow calculation. This calculation is made using the averages of five depth and velocity profiles across one measured stream width as well as a correction constant based on a rough or smooth stream bottom. The estimated flow calculation smooth/rough correction factor is based on the guidance for flow estimates found in TCEQ's Surface Water Quality Monitoring, Volume 1[2].

Biological Sample Collection

Aquatic benthic macroinvertebrates were collected at eighteen stream sites during two sampling events during 2019: spring (May) and fall (October). Macroinvertebrates were collected using a D-frame kick net with a 550 μm mesh from riffle areas. If there was no riffle area, samples were taken within run/glide areas or pools. September 2019 was an unusually dry month, which led to moderate to severe drought conditions. By October, many streams had lower flows than normal, and some were intermittent with pools. During fall sampling, sample collection was made within the areas that were previously covered with water, some of which

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[1] Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.

[2] TCEQ, revised August 2012. Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods. TCEQ RG-415. August 2012.

were in pooled areas. Bottom substrate in front of the net opening was disturbed to dislodge organisms, which were collected in the net along with bottom material. Collected samples were transferred from the D-frame net to sample containers and preserved in the field with 100% isopropyl alcohol. Following transport to the in-house laboratory, macroinvertebrates in the samples were separated from the debris and identified. Samples which appeared to have more than 175 (+ or -20%) were subsampled according to new SOPs, and similar to those found in TCEQ's Surface Water Quality Monitoring, Volume 2[3]. Most organisms were identified to family level with a few noted exceptions. In accordance with the current City of Fort Worth SOP, Chironomidae was identified to sub-family, Turbellaria and Hirudinea were identified to class, and Nematoda was identified to phylum.

Aquatic Macroinvertebrate Data Analysis

The TCEQ macroinvertebrate Texas Index of Biotic Integrity (TX-IBI) for kick net samples was used to analyze the data. The TX-IBI methodology is found in the TCEQ's *Surface Water Quality Monitoring Procedures, Volume 2*[4] and applies 12 macroinvertebrate community structural and functional metrics for the assessment of biotic integrity. This TX-IBI method used is designed for macroinvertebrate samples collected with a D-frame kick net sampler. Biological metrics are calculated with the resulting macroinvertebrate identification data, an interim score is assigned to each individual metric, and the individual metric scores are summed to produce an overall score for each individual site. Scores generated at each site are compared to values in TCEQ guidelines to determine an aquatic life use rating. The values for the aquatic life use ratings found in the TCEQ guidelines were developed based on data collected from reference sites within each ecoregion. This method gives an individual value for each site without a direct comparison to a specific reference site, but to values from ecoregional reference sites. Individual sites may also be compared to themselves year to year on a seasonal basis (spring to spring and fall to fall) to demonstrate biological community changes within each reach.

Results and Discussion

Habitat Assessments and Physico-chemical Sampling

Habitat assessment scores for spring and fall 2019 are shown in Table 2. Habitat assessment scores for Big Fossil Creek site 1 was ranked in the optimal category during spring sampling event and as sub-optimal during fall sampling. The remaining sites were ranked as either sub-optimal or marginal categories during both sampling events.

Spring and fall 2019 chemical water quality parameter ranges across all sampled sites are listed in Table 3. Physico-chemical data measurements taken during spring and fall 2019 sampling events are presented in Tables 4 through 7.

Any site which indicates probable sewage infiltration by visual and olfactory observation, elevated *E. coli* test results (>10,000 MPN/100mL) along with elevated ammonia-nitrogen (>1.0 mg/L) results are referred to the Fort Worth Water Department for investigation. There were no

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[3] TCEQ, revised May 2012. Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data. TCEQ RG-416. May 2014.

[4] ibid

sites sampled during either sampling event indicated the presence of sewage infiltration. If any sample results were >2420 MPN/100 mL, the sites were retested with sample dilutions added to determine a more accurate number.

Table 2. Habitat Scores Collected for Mary's Creek, Big Fossil Creek, Sycamore Creek, Marine Creek, Overton Park, Little Fossil Creek, and Farmer's Branch in Spring and Fall 2019.

Site	Spring 2019	Fall 2019	Habitat Score	Value
MRY0+	159	135	Optimal	160-200
MRY1	127	131	Sub-optimal	110-159
MRY2	105	117	Marginal	60-109
MRY3	115	127	Poor	<60
FAR3^	124	NS		
BFC1	177	146		
BFC2	100	113		
BFC3	118	130		
SYC1	92	102		
SYC2	113	117		
SYC3	NS	127		
MAR1	102	NS		
MAR2	118	96		
MAR3	154	134		
OVR1	122	120		
OVR2	99	123		
OVR3	100	98		
LFC1	125	110		
LFC2	121	117		
LFC3	99	99		

+=Potential new reference site, non-regulatory site
^= Non-regulatory site
NS=not sampled

Table 3. Minimum and Maximum Values of Water Quality Parameters Spring and Fall 2019 Bioassessment Sampling.

	Spring 2019		Fall 2019	
Parameter	Minimum	Maximum	Minimum	Maximum
Water temperature, °C	24.4	28.5	15.7	19.5
pH, s.u.	7.61	8.41	7.54	8.52
Conductivity (µS)	350	770	200	700
DO (mg/L)	4.05	7.08	3.53	9.1
Turbidity (NTUs)	0.81	9.82	0.61	11.1
NO3-N (mg/L)	0.04	4.11	0	1.97
NH3-N (mg/L)	0.01	2.27	0.06	0.88
PO4 (mg/L)	0	0.2	0	0.3
E. coli (MPN/100mL)	32	>2420	41	>2420

Table 4. Physico-chemical Results for Samples Collected during Bioassessments from Mary's Creek, Farmer's Branch, Big Fossil Creek, and Sycamore Creek in Spring 2019.

		STATION									
PARAMETER	MRY0^{+}	MRY1	MRY2	MRY3	FAR3^	BFC1	BFC2	BFC3	SYC1	SYC2	SYC3
Width (ft)	11.3	44.0	32.0	76.0	8.0	13.0	41.0	58.0	30.0	53.0	NS
Avg. depth (ft)	0.29	0.86	1.10	0.58	0.27	0.60	0.30	0.16	1.24	1.06	NS
Avg. Velocity (ft/s)	0.492	1.35	1.52	1.43	0.15	0.70	0.64	0.44	0.30	0.38	NS
Estimated flow (cfs)	1.451	45.98	48.15	56.73	0.29	4.37	6.30	3.67	8.93	16.90	NS
Water Temperature (ºC)	22.3	26.6	27.8	27.1	24.4	27.3	27.9	28.1	25.7	25.6	26.5
pH (s.u.)	7.74	8.15	8.20	7.98	7.74	8	8.17	8.24	7.94	7.61	7.93
Conductivity (µS)	660	490	500	520	770	460	490	480	500	570	580
DO (mg/L)	5.43	4.77	4.79	4.8	6.6	6.65	7.08	6.12	5.27	4.05	5.97
Turbidity (NTUs)	1.52	2.50	2.29	2.19	0.97	5.75	4.05	6.09	1.86	1.77	3.08
NO_3-N (mg/L)	0.03	0.04	0.13	0.19	4.11	0.15	0.18	0.19	0.25	0.96	0.69
NH_3-N (mg/L)	0.05	0.09	0.04	0.11	0.05	0.11	0.05	0.15	2.27	0.01	0.59
PO_4 (mg/L)	0.09	0.00	0.09	0.11	0.00	0	0.01	0.00	0.06	0.20	0.10
E. coli (MPN/100mL)	517	61	50	75	435	56	228	79	387	1203	866

+=Potential new reference site, non-regulatory site

^= Non-regulatory site

NS=not sampled

Table 5. Physico-chemical Results for Samples Collected during Bioassessments from Marine Creek, Overton Park Creek, and Little Fossil Creek in Spring 2019.

	STATION								
PARAMETER	MAR1	MAR2	MAR3	OVR1	OVR2	OVR3	LFC1	LFC2	LFC3
Width (ft)	17.0	28.0	18.0	14.0	17.0	24.0	8.0	23.0	22.0
Avg. depth (ft)	0.80	0.72	0.66	1.08	0.46	0.84	0.38	0.46	1.34
Avg. Velocity (ft/s)	0.68	0.76	1.36	0.05	0.12	0.07	0.52	0.16	0.13
Estimated flow (cfs)	7.40	12.26	12.92	0.63	0.78	1.13	1.26	1.52	3.45
Water Temperature (ºC)	27.3	27.8	27.6	24.7	25.4	25.8	27.9	26.4	28.5
pH (s.u.)	8.36	8.26	8.10	7.95	7.79	7.69	8.04	8.17	8.41
Conductivity (µS)	350	440	470	640	540	580	510	490	510
DO (mg/L)	5.75	5.04	4.52	4.56	6.01	4.44	6.39	6.48	7.07
Turbidity (NTUs)	4.22	5.80	9.82	1.80	1.34	0.81	3.44	4.12	4.33
NO_3-N (mg/L)	0.05	0.13	0.46	1.57	0.59	0.46	0.10	0.07	0.06
NH_3-N (mg/L)	0.13	0.16	1.82	0.22	0.11	0.10	0.08	0.07	0.14
PO_4 (mg/L)	0.00	0.00	0.00	0.00	0.13	0.12	0.00	0.00	0.00
E. coli (MPN/100mL)	126	135	1986	>2420*	921	291	32	225	98

*OVR1 was retested on June 14, 2019; results were 133 MPN/100ml

Table 6. Physico-chemical Results for Samples Collected during Bioassessments from Mary's Creek, Big Fossil Creek, and Sycamore Creek in Fall 2019.

		STATION									
PARAMETER	**MRY0+**	**MRY1**	**MRY2**	**MRY3**	**FAR3^**	**BFC1**	**BFC2**	**BFC3**	**SYC1**	**SYC2**	**SYC3**
Width (ft)	11	56.0	23.0	71.0	NS	12.0	22.0	26.0	46.0	54.0	31.0
Avg. depth (ft)	0.2	0.52	0.42	0.10	NS	0.40	0.84	0.76	0.05	0.72	0.5
Avg. Velocity (ft/s)	0.028	0.020	0.026	0.520	NS	0.022	0.052	0.032	0.560	0.036	0.296
Estimated flow (cfs)	0.055	0.520	0.226	3.320	NS	0.084	0.769	0.506	1.070	1.120	3.670
Water Temperature (ºC)	13.4	17.4	17.2	17.0	NS	16.5	18.8	15.9	17.6	18.2	18.5
pH (s.u.)	7.92	8.52	8.48	8.06	NS	7.73	7.74	7.88	8.02	8.14	8.25
Conductivity (µS)	610	200	270	270	NS	520	590	470	220	210	250
DO (mg/L)	8.58	5.83	4.86	3.93	NS	5.93	5.16	6.69	4.84	5.00	5.63
Turbidity (NTUs)	2.25	5.46	0.61	2.66	NS	0.99	11.10	3.93	2.59	3.88	1.72
NO_3-N (mg/L)	0.03	0.09	0.00	0.12	NS	0.01	0.13	0.36	0.03	0.25	0.38
NH_3-N (mg/L)	0.07	0.10	0.08	0.12	NS	0.13	0.14	0.14	0.15	0.06	0.10
PO_4 (mg/L)	0.26	0.00	0.00	0.00	NS	0.00	0.00	0.00	0.00	0.00	0.00
E. coli (MPN/100mL)	770	99	105	365	NS	41	1120	61	144	121	>2420*

+=Potential new reference site, non-regulatory site

^= Non-regulatory site

NS=not sampled

*SYC3 was retested on October 17, 2019; results were 649 MPN/100ml

Table 7. Physico-chemical Results for Samples Collected during Bioassessments from Marine Creek, Overton Park Creek, and Little Fossil Creek in Fall 2019.

	STATION								
PARAMETER	**MAR1**	**MAR2**	**MAR3**	**OVR1**	**OVR2**	**OVR3**	**LFC1**	**LFC2**	**LFC3**
Width (ft)	NS	19.0	16.0	11.0	17.0	19.5	8.0	18.0	15.0
Avg. depth (ft)	NS	1.04	0.40	0.32	0.30	0.46	0.22	0.42	0.56
Avg. Velocity (ft/s)	NS	0.030	0.044	0.026	0.036	0.026	0.046	0.040	0.070
Estimated flow (cfs)	NS	0.474	0.225	0.080	0.147	0.187	0.073	0.242	0.529
Water Temperature (ºC)	NS	15.7	17.5	16.8	19.5	18.2	17.9	16.8	16.8
pH (s.u.)	NS	7.88	7.81	8.15	7.89	7.82	7.54	7.68	8.02
Conductivity (µS)	NS	570	700	250	280	280	680	540	500
DO (mg/L)	NS	9.10	7.53	3.53	4.84	3.65	4.87	4.74	6.07
Turbidity (NTUs)	NS	2.29	2.49	1.48	2.86	1.55	1.39	4.80	1.57
NO_3-N (mg/L)	NS	1.50	1.97	0.43	0.41	0.08	0.06	0.19	0.05
NH_3-N (mg/L)	NS	0.88	0.18	0.12	0.08	0.21	0.09	0.10	0.09
PO_4 (mg/L)	NS	0.30	0.05	0.00	0.00	0.00	0.06	0.00	0.01
E. coli (MPN/100mL)	NS	167	225	980	248	276	115	549	99

NS=not sampled

Biological Data Analysis

Prior to spring sampling, the area experienced periods of frequent and heavy rainfall, which led to higher flows during the sampling period. Before fall sampling, the area experienced unusually dry conditions during September which led to moderate to severe drought conditions. Spring 2019 TX-IBI metric calculations (Table 8 and Figure 1) returned a score of "high" aquatic life use for BFC1. Fourteen sites (MRY0, MRY1, MRY2, MRY3, BFC2, BFC3, SYC1, SYC2, MAR3, OVR1, OVR2, LFC1, LFC2, AND LFC3) indicated scores within the "intermediate" and the remaining four sites (FAR3, MAR1, MAR2, and OVR3) showed "limited" aquatic life use. Sycamore Creek site 3 (SYC3) was not sampled in the spring because it was not wadeable. TX-IBI macroinvertebrate metric calculations for spring samples are displayed in Tables 9-12. Spring macroinvertebrate abundance data are shown in Tables 17-18.

TX-IBI analysis for the fall 2019 macroinvertebrate data (Table 8 and Figure 2) indicated eight sites (MRY1, MRY2, MRY3, BFC3, SYC1, SYC2, SYC3, and LFC2) were rated with "high" aquatic life use and eight sites (BFC1, BFC2, MAR2, MAR3, OVR1, OVR3, LFC1, and LFC3) were rated with "intermediate" aquatic life use. The remaining site (MRY0) indicated a "limited" aquatic life use. Results for the individual metric calculations are included in Tables 13-16. Macroinvertebrate abundance data for fall are presented in Tables 19-20.

Comparison of each site's scores will be made on a seasonal basis at the end of monitoring or permit term.

Table 8. Texas Macroinvertebrate Index of Biotic Integrity Scores (TX-IBI) for Mary's Creek, Farmer's Branch, Big Fossil Creek, Sycamore Creek, Marine Creek, Overton Park Creek, and Little Fossil Creek in Spring and Fall 2019.

Site	Spring 2019	Fall 2019	Aquatic Life Use	Score
MRY0+	24	20	Exceptional	>36
MRY1	27	35	High	29-36
MRY2	23	33	Intermediate	22-28
MRY3	26	31	Limited	<22
FAR3^	19	NS		
BFC1	31	28		
BFC2	25	27		
BFC3	25	30		
SYC1	28	33		
SYC2	22	31		
SYC3	NS	30		
MAR1	21	NS		
MAR2	20	26		
MAR3	24	27		
OVR1	24	24		
OVR2	23	19		
OVR3	20	26		
LFC1	23	28		
LFC2	27	31		
LFC3	28	26		

+=Potential new reference site, non-regulatory site
^ =Non-regulatory site
NS=not sampled

Conclusion

Rapid bioassessments were performed on stream sites within seven watersheds in Fort Worth during spring and fall 2019. Two new sites were sampled, increasing the coverage of the city's watersheds. Habitat assessment scores for sampled sites were classified in the sub-optimal or marginal categories for all but one site during spring, which was rated as having optimal habitat. All sites were rated as having sub-optimal or marginal habitat during fall sampling. Physico-chemical test results were within normal range for all sampled sites during both sampling events.

Texas IBI calculations for the spring 2019 macroinvertebrate data showed most sites were categorized with intermediate (fourteen sites) aquatic life uses, with four sites rated with limited aquatic life uses, and one site indicating a high aquatic life use. Fall 2019 data analysis indicated eight sites were rated with intermediate aquatic life use, two sites were rated with limited aquatic life use, and eight sites returned results in the high aquatic life use category.

Table 9. TX-IBI Metric Calculations for Macroinvertebrate Community Samples Collected from Mary's Creek, Farmer's Branch, Big Fossil Creek, and Sycamore Creek in Spring 2019.

TX-IBI Metrics	MRY0$^+$	MRY1	MRY2	MRY3	FAR3^	BFC1	BFC2	BFC3	SYC1	SYC2	SYC3
Taxa Richness	16	14	13	17	13	19	14	10	12	14	NS
EPT taxa richness	7	6	6	6	5	7	6	5	5	5	NS
HBI biotic index	4.55	4.13	3.96	4.07	4.26	4.37	4.33	3.74	4.32	4.76	NS
% Chironomidae	29.09	4.79	14.78	9.07	16.59	10.17	10.04	9.36	30.63	35.48	NS
% dominant taxon	27.64	57.49	38.42	57.52	51.57	38.98	69.00	33.96	24.65	34.41	NS
% dominant FFG	53.61	62.87	54.19	0.68	58.74	54.96	85.15	62.57	49.30	72.04	NS
% Predators	2.64	6.59	2.46	0.06	2.69	8.23	6.55	2.94	5.28	2.15	NS
Ratio of intolerant:tolerant taxa	2.15	11.85	5.34	8.31	4.44	3.92	6.90	9.11	2.23	1.51	NS
% of total Trichoptera as Hydropsychidae	82.58	47.37	64.29	78.57	88.46	60.18	66.67	74.77	52.88	57.89	NS
# of non-insect taxa	2.0	2.0	2.0	2.0	1.0	5.0	2.0	1.0	2.0	5.0	NS
% collectors-gatherers	53.61	62.87	54.19	0.68	34.98	54.96	85.15	34.49	49.30	72.04	NS
% of total number as Elmidae	1.20	0.00	0.49	0.48	0.00	2.18	0.44	0.00	1.06	2.69	NS

+=Potential new reference site, non-regulatory site

^ =Non-regulatory site

NS=not sampled

Table 10. TX-IBI Scores for Macroinvertebrate Community Samples Collected from Mary's Creek, Farmer's Branch, Big Fossil Creek, and Sycamore Creek in Spring 2019.

TX-IBI Scores	MRY0$^+$	MRY1	MRY2	MRY3	FAR3^	BFC1	BFC2	BFC3	SYC1	SYC2	SYC3
Taxa Richness	3	2	2	3	2	3	2	2	2	2	NS
EPT taxa richness	3	2	2	2	2	3	2	2	2	2	NS
HBI biotic index	2	3	3	3	3	3	3	4	3	2	NS
% Chironomidae	1	3	2	3	1	2	2	3	1	1	NS
% dominant taxon	3	1	2	1	1	2	1	2	3	2	NS
% dominant FFG	2	1	1	4	1	1	1	1	2	1	NS
% Predators	1	4	1	1	1	4	4	1	4	1	NS
Ratio of intolerant:tolerant taxa	2	4	4	4	3	3	4	4	2	1	NS
% of total Trichoptera as Hydropsychidae	1	3	2	1	1	2	2	2	2	2	NS
# of non-insect taxa	2	2	2	2	1	3	2	1	2	3	NS
% collectors-gatherers	1	1	1	1	2	1	1	2	1	1	NS
% of total number as Elmidae	4	1	1	1	1	4	1	1	4	4	NS
Total Score	**25**	**27**	**23**	**26**	**19**	**31**	**25**	**25**	**28**	**22**	**NS**
Aquatic Life Use Rating	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**Limited**	**High**	**Intermediate**	**Intermediate**	**Intermediate**	**Intermediate**	**NS**

+=Potential new reference site, non-regulatory site
^ =Non-regulatory site
NS=not sampled

Table 11. TX-IBI Metric Calculations for Macroinvertebrate Community Samples Collected from Marine Creek, Overton Park Creek, and Little Fossil Creek in Spring 2019.

TX-IBI Metrics	MAR1	MAR2	MAR3	OVR1	OVR2	OVR3	LFC1	LFC2	LFC3
Taxa Richness	12	14	18	12	19	9	13	11	13
EPT taxa richness	5	6	5	4	5	5	4	4	6
HBI biotic index	4.46	4.50	4.59	4.67	4.58	4.04	4.83	4.26	4.29
% Chironomidae	29.64	27.23	21.45	27.08	30.58	10.90	42.15	17.56	19.95
% dominant taxon	40.71	48.94	41.58	38.89	35.87	47.98	38.84	53.66	33.15
% dominant FFG	73.93	75.32	69.64	52.78	65.79	57.32	65.70	75.12	53.10
% Predators	3.57	3.40	2.97	15.28	4.63	1.87	19.01	9.76	13.75
Ratio of intolerant:tolerant taxa	2.18	2.46	2.48	2.27	1.98	7.92	1.28	4.39	4.01
% of total Trichoptera as Hydropsychidae	54.55	50.00	71.70	11.63	42.42	92.11	51.43	43.33	73.91
# of non-insect taxa	1.0	3.0	7.0	3.0	8.0	1.0	3.0	3.0	2.0
% collectors-gatherers	73.93	75.32	69.64	52.78	65.79	57.32	65.70	75.12	53.10
% of total number as Elmidae	5.36	0.43	2.64	0.00	0.00	0.00	1.24	6.34	1.89

Table 12. TX-IBI Scores for Macroinvertebrate Community Samples Collected from Marine Creek, Overton Park Creek, and Little Fossil Creek in Spring 2019.

TX-IBI Scores	MAR1	MAR2	MAR3	OVR1	OVR2	OVR3	LFC1	LFC2	LFC3
Taxa Richness	2	2	3	2	3	2	2	2	2
EPT taxa richness	2	2	2	2	2	2	2	2	2
HBI biotic index	3	3	2	2	2	3	2	3	3
% Chironomidae	1	1	1	1	1	2	1	1	1
% dominant taxon	1	1	1	2	2	1	2	1	2
% dominant FFG	1	1	1	2	1	1	1	1	2
% Predators	1	1	1	3	1	1	3	4	4
Ratio of intolerant:tolerant taxa	2	2	2	2	2	4	1	3	3
% of total Trichoptera as Hydropsychidae	2	3	2	4	3	1	2	3	2
# of non-insect taxa	1	2	4	2	4	1	2	2	2
% collectors-gatherers	1	1	1	1	1	1	1	1	1
% of total number as Elmidae	4	1	4	1	1	1	4	4	4
Total Score	**21**	**20**	**24**	**24**	**23**	**20**	**23**	**27**	**28**
Aquatic Life Use Rating	**Limited**	**Limited**	**Intermediate**	**Intermediate**	**Intermediate**	**Limited**	**Intermediate**	**Intermediate**	**Intermediate**

Table 13. TX-IBI Metric Calculations for Macroinvertebrate Community Samples Collected from Mary's Creek, Farmer's Branch, Big Fossil Creek, and Sycamore Creek in Fall 2019.

TX-IBI Metrics	MRY0^{+}	MRY1	MRY2	MRY3	FAR3^	BFC1	BFC2	BFC3	SYC1	SYC2	SYC3
Taxa Richness	15	23	22	22	NS	17	21	25	23	18	15
EPT taxa richness	2	8	4	5	NS	3	5	8	8	7	8
HBI biotic index	6.55	5.99	5.56	6.37	NS	7.01	7.07	5.76	4.91	4.65	4.21
% Chironomidae	31.37	8.22	15.00	22.45	NS	9.20	14.86	29.81	33.11	24.17	18.03
% dominant taxon	26.47	17.12	13.00	19.73	NS	29.89	45.14	26.71	31.60	21.67	38.20
% dominant FFG	46.57	41.78	43.50	0.51	NS	46.55	73.14	49.07	39.66	53.33	57.08
% Predators	31.86	16.44	21.50	0.31	NS	10.92	17.71	24.22	12.94	11.25	9.87
Ratio of intolerant:tolerant taxa	0.40	0.78	1.17	0.65	NS	0.33	0.25	0.73	1.09	1.55	2.88
% of total Trichoptera as Hydropsychidae	No Trich	0.00	0.00	25.00	NS	No Trich	0.00	41.18	29.73	17.65	2.74
# of non-insect taxa	4.0	6.0	9.0	6.0	NS	7.0	7.0	6.0	8.0	5.0	3.0
% collectors-gatherers	46.57	41.78	43.50	0.51	NS	46.55	73.14	49.07	39.66	53.33	57.08
% of total number as Elmidae	0.49	5.48	5.00	7.48	NS	6.32	1.14	1.86	2.86	13.75	2.58

+=Potential new reference site, non-regulatory site

^ =Non-regulatory site

NS=not sampled

Table 14. TX-IBI Scores for Macroinvertebrate Community Samples Collected from Mary's Creek, Farmer's Branch, Big Fossil Creek, and Sycamore Creek in Fall 2019.

TX-IBI Scores	MRY0^{+}	MRY1	MRY2	MRY3	FAR3^	BFC1	BFC2	BFC3	SYC1	SYC2	SYC3
Taxa Richness	3	4	4	4	NS	3	3	4	4	3	3
EPT taxa richness	1	3	2	2	NS	1	2	3	3	3	3
HBI biotic index	1	1	1	1	NS	1	1	1	2	2	3
% Chironomidae	1	3	2	1	NS	3	2	1	1	1	1
% dominant taxon	3	4	4	4	NS	3	1	3	2	4	2
% dominant FFG	2	3	3	4	NS	2	1	2	3	2	1
% Predators	2	3	3	1	NS	4	3	3	4	4	4
Ratio of intolerant:tolerant taxa	1	1	1	1	NS	1	1	1	1	1	2
% of total Trichoptera as Hydropsychidae	1	4	4	4	NS	1	4	3	3	4	4
# of non-insect taxa	3	4	4	4	NS	4	4	4	4	3	2
% collectors-gatherers	1	1	1	1	NS	1	1	1	2	1	1
% of total number as Elmidae	1	4	4	4	NS	4	4	4	4	3	4
Total Score	**20**	**35**	**33**	**31**	**NS**	**28**	**27**	**30**	**33**	**31**	**30**
Aquatic Life Use Rating	**Limited**	**High**	**High**	**High**	NS	**Intermediate**	**Intermediate**	**High**	**High**	**High**	**High**

+=Potential new reference site, non-regulatory site

^ =Non-regulatory site

NS=not sampled

Table 15. TX-IBI Metric Calculations for Macroinvertebrate Community Samples Collected from Marine Creek, Overton Park Creek, and Little Fossil Creek in Fall 2019.

TX-IBI Metrics	MAR1	MAR2	MAR3	OVR1	OVR2	OVR3	LFC1	LFC2	LFC3
Taxa Richness	NS	17	19	14	13	22	16	23	14
EPT taxa richness	NS	3	6	4	5	6	3	7	1
HBI biotic index	NS	6.73	5.21	7.58	5.51	5.57	6.90	6.01	7.71
% Chironomidae	NS	16.47	42.86	17.59	56.02	33.82	4.67	38.54	15.44
% dominant taxon	NS	15.29	37.95	31.66	43.15	28.73	34.58	28.78	29.41
% dominant FFG	NS	54.12	71.43	36.18	65.56	58.91	50.93	57.56	45.59
% Predators	NS	12.94	8.93	36.18	20.33	18.18	32.24	11.71	11.76
Ratio of intolerant:tolerant taxa	NS	0.29	0.96	0.21	0.54	0.85	0.27	0.35	0.05
% of total Trichoptera as Hydropsychidae	NS	100.00	38.46	50.00	66.67	0.00	0.00	0.00	No Trich
# of non-insect taxa	NS	8.0	5.0	2.0	4.0	7.0	6.0	8.0	7.0
% collectors-gatherers	NS	54.12	71.43	28.64	65.56	58.91	15.89	57.56	45.59
% of total number as Elmidae	NS	11.76	5.80	0.00	0.00	0.36	0.47	4.88	1.47

NS=not sampled

Table 16. TX-IBI Scores for Macroinvertebrate Community Samples Collected from Marine Creek, Overton Park Creek, and Little Fossil Creek in Fall 2019.

TX-IBI Scores	MAR1	MAR2	MAR3	OVR1	OVR2	OVR3	LFC1	LFC2	LFC3
Taxa Richness	NS	3	3	2	2	4	3	4	2
EPT taxa richness	NS	1	2	2	2	2	1	3	1
HBI biotic index	NS	1	2	1	1	1	1	1	1
% Chironomidae	NS	1	1	1	1	1	3	1	2
% dominant taxon	NS	4	2	2	1	3	2	3	3
% dominant FFG	NS	2	1	4	1	1	2	1	2
% Predators	NS	4	4	2	3	3	2	4	4
Ratio of intolerant:tolerant taxa	NS	1	1	1	1	1	1	1	1
% of total Trichoptera as Hydropsychidae	NS	1	3	3	2	4	4	4	1
# of non-insect taxa	NS	4	3	2	3	4	4	4	4
% collectors-gatherers	NS	1	1	3	1	1	4	1	1
% of total number as Elmidae	NS	3	4	1	1	1	1	4	4
Total Score	**NS**	**26**	**27**	**24**	**19**	**26**	**28**	**31**	**26**
Aquatic Life Use Rating	**NS**	**Intermediate**	**Intermediate**	**Intermediate**	**Limited**	**Intermediate**	**Intermediate**	**High**	**Intermediate**

NS=not sampled

Table 17. Macroinvertebrate abundances collected at each sample site along Mary's Creek, Farmer's Branch, Big Fossil Creek, and Sycamore Creek in Spring 2019.

Common Name	Order	Family	MRY0+	MRY1	MRY2	MRY3	FAR3^	BFC1	BFC2	BFC3	SYC1	SYC2	SYC3
Flatworms	Turbellaria		3	4	4	13	0	21	5	2	2	2	0
worms	Oligochaeta	Lumbriculidae	0	0	0	0	0	1	0	0	0	0	0
		Tubificidae	0	0	0	0	0	0	0	0	0	5	0
		Naididae	0	0	0	0	0	0	0	0	1	0	0
Leeches	Hirudinea		0	0	0	0	0	0	0	0	0	0	0
Snails	Gastropoda	Physidae	4	0	0	0	1	0	0	0	0	1	0
		Planorbidae	0	0	0	0	0	0	0	0	0	1	0
Clams	Bivalvia	Corbiculidae	0	0	0	0	0	15	0	0	0	0	0
		Sphaeridae	0	0	0	0	0	2	0	0	0	1	0
Crawfish	Decapoda	Cambaridae	0	0	0	0	0	0	0	0	0	0	0
Scuds	Amphipoda	Hyallelidae	0	1	1	6	0	19	3	0	0	0	0
Mayflies	Ephemeroptera	Baetidae	98	96	78	241	44	161	158	100	61	58	0
		Caenidae	0	1	0	6	0	2	15	1	1	2	0
		Heptageniidae	2	12	2	0	0	0	0	0	0	0	0
		Leptophyphidae	0	1	0	1	0	1	2	0	0	0	0
Caddisflies	Trichoptera	Brachycentridae	1	0	1	0	9	1	1	12	6	2	0
		Helicopsychidae	3	0	0	0	0	0	0	0	0	0	0
		Hydropsychidae	109	9	9	22	115	68	10	80	55	22	0
		Hydroptilidae	7	10	2	5	2	2	0	0	0	0	0
		Philopotamidae	12	0	2	1	4	42	4	15	43	14	0
Damselflies	Zygoptera	Coenagrionidae	6	4	1	1	2	5	3	2	0	0	0
True water bugs/striders	Hemiptera	Naucoridae	0	1	0	0	0	0	0	0	0	0	0
		Saldidae	1	0	0	0	0	0	0	0	0	0	0
Beetles	Coleoptera	Dytiscidae	0	0	0	1	0	0	0	0	0	0	0
		Elmidae	5	0	1	2	0	9	1	0	3	5	0

+=Potential new reference site, non-regulatory site

^ =Non-regulatory site

Table 17. Macroinvertebrate abundances collected at each sample site along Mary's Creek, Farmer's Branch, Big Fossil Creek, and Sycamore Creek in Spring 2019, continued.

Common Name	Order	Family	MRY0+	MRY1	MRY2	MRY3	FAR3^	BFC1	BFC2	BFC3	SYC1	SYC2	SYC3
Butterflies and moths	Lepidoptera	Crambidae	0	0	0	0	4	2	0	0	0	0	0
Midges and flies	Diptera	Ceratopogonidae	0	0	0	1	0	0	0	0	0	0	0
		Simuliidae	44	20	72	80	3	20	4	127	25	7	0
		Stratiomyidae	0	0	0	0	1	0	0	0	0	0	0
		Tipulidae	0	0	0	1	1	0	0	0	0	0	0
		Chironominae	115	5	25	28	33	31	15	28	70	64	0
		Tanypodinae	1	2	0	8	4	8	7	7	13	2	0
		Orthocladiinae	5	1	5	2	0	3	1	0	4	0	0
Number of Individuals			416	167	203	419	223	413	229	374	284	186	0

+=Potential new reference site, non-regulatory site

^ =Non-regulatory site

Table 18. Macroinvertebrate abundances collected at each sample site along Marine Creek, Overton Park Creek, and Little Fossil Creek in Spring 2019.

Common Name	Order	Family	MAR1	MAR2	MAR3	OVR1	OVR2	OVR3	LFC1	LFC2	LFC3
Flatworms	Turbellaria		0	0	2	0	9	0	39	14	43
worms	Oligochaeta	Lumbriculidae	0	1	1	0	1	1	0	0	0
		Tubificidae	0	0	3	0	0	0	1	0	0
		Naididae	0	0	0	0	4	0	0	0	0
Leeches	Hirudinea		4	3	4	2	8	0	0	1	0
Snails	Gastropoda	Physidae	0	0	0	1	1	0	0	0	0
		Planorbidae	0	0	0	0	1	0	0	0	0
Clams	Bivalvia	Corbiculidae	0	0	6	0	0	0	0	1	0
		Sphaeridae	0	0	0	0	0	0	0	0	0
Crawfish	Decapoda	Cambaridae	0	1	2	0	0	0	0	0	1
Scuds	Amphipoda	Hyallelidae	0	0	5	0	1	0	1	0	0
Mayflies	Ephemeroptera	Baetidae	114	115	126	56	217	154	57	110	123
		Caenidae	0	0	1	0	0	0	0	0	0
		Heptageniidae	0	0	0	0	0	0	0	0	0
		Leptophyphidae	0	0	0	0	0	0	0	0	0
Caddisflies	Trichoptera	Brachycentridae	4	4	0	0	26	1	1	0	2
		Helicopsychidae	0	1	0	0	0	0	0	0	11
		Hydropsychidae	24	22	38	5	70	70	18	13	85
		Hydroptilidae	5	10	7	37	62	1	0	5	11
		Philopotamidae	11	7	8	1	7	4	16	12	6
Damselflies	Zygoptera	Coenagrionidae	1	0	3	1	0	0	2	0	0
True water bugs/striders	Hemiptera	Naucoridae	0	0	0	0	0	0	0	0	0
		Saldidae	0	0	0	0	0	0	0	0	0
Beetles	Coleoptera	Dytiscidae	0	0	0	0	0	0	0	0	0
		Elmidae	15	1	8	0	0	0	3	13	7

Table 18. Macroinvertebrate abundances collected at each sample site along Marine Creek, Overton Park Creek, and Little Fossil Creek in Spring 2019, continued.

Common Name	Order	Family	MAR1	MAR2	MAR3	OVR1	OVR2	OVR3	LFC1	LFC2	LFC3
Butterflies and moths	Lepidoptera	Crambidae	0	0	1	0	0	0	0	0	8
Midges and flies	Diptera	Ceratopogonidae	0	0	0	0	0	0	0	0	0
		Simuliidae	19	6	23	1	10	55	2	0	0
		Stratiomyidae	0	0	0	0	0	0	0	0	0
		Tipulidae	0	0	0	0	1	0	0	0	0
		Chironominae	77	58	64	15	156	29	94	29	62
		Tanypodinae	5	5	0	19	11	6	5	5	8
		Orthocladiinae	1	1	1	5	18	0	3	2	4
Number of Individuals			280	235	303	144	605	321	242	205	371

Table 19. Macroinvertebrate abundances collected at each sample site along Mary's Creek, Farmer's Branch, Big Fossil Creek and Sycamore Creek during Fall 2019.

Common Name	Order	Family	MRY0+	MRY1	MRY2	MRY3	FAR3^	BFC1	BFC2	BFC3	SYC1	SYC2	SYC3
Flatworms	Turbellaria		0	2	3	0	0	2	2	4	4	2	0
Worms	Oligochaeta	Lumbriculidae	0	0	0	0	0	0	0	0	0	0	0
		Tubificidae	0	0	0	0	0	0	0	0	0	0	0
		Naididae	0	0	0	0	0	0	7	0	0	0	0
Leeches	Hirudinea		0	0	0	0	0	0	7	0	3	0	1
Snails	Gastropoda	Physidae	38	25	21	16	0	43	8	4	4	0	1
		Planorbidae	6	4	3	2	0	5	1	0	4	0	0
		Lymnaeidae	0	0	1	0	0	0	0	0	0	0	0
		Hydrobiidae	0	0	2	0	0	12	2	2	0	0	0
		Ancylidae	0	0	1	1	0	11	0	0	7	1	1
Clams	Bivalvia	Corbiculidae	0	6	4	1	0	2	0	2	2	2	0
		Sphaeridae	0	9	2	1	0	0	0	1	6	14	0
Crawfish	Decapoda	Cambaridae	13	0	0	0	0	0	0	0	0	0	0
Scuds	Amphipoda	Hyallelidae	1	8	3	3	0	52	79	11	1	1	0
Mayflies	Ephemeroptera	Baetidae	19	1	0	0	0	6	2	12	14	39	89
		Caenidae	7	7	25	26	0	2	12	5	13	2	3
		Heptageniidae	0	5	9	2	0	0	0	0	0	0	2
		Leptophyphidae	0	25	24	5	0	5	6	2	2	0	0
Caddisflies	Trichoptera	Brachycentridae	0	0	0	0	0	0	0	0	2	1	1
		Helicopsychidae	0	6	26	0	0	0	3	6	57	5	47
		Hydropsychidae	0	0	0	1	0	0	0	14	77	12	2
		Hydroptilidae	0	2	0	0	0	0	1	1	4	4	2
		Leptoceridae	0	1	0	0	0	0	0	2	0	0	0
		Philopotamidae	0	0	0	3	0	0	0	11	119	46	21
		Odontoceridae	0	2	0	0	0	0	0	0	0	0	0

+=Potential new reference site, non-regulatory site

^ =Non-regulatory site

Table 19. Macroinvertebrate abundances collected at each sample site along Mary's Creek, Farmer's Branch, Big Fossil Creek and Sycamore Creek during Fall 2019, continued.

Common Name	Order	Family	MRY0+	MRY1	MRY2	MRY3	FAR3^	BFC1	BFC2	BFC3	SYC1	SYC2	SYC3
Dragonflies	Anisoptera	Aeshnidae	0	0	0	0	0	1	0	0	0	0	0
		Gomphidae	0	0	0	1	0	0	0	0	0	0	0
		Libellulidae	4	1	2	1	0	2	1	1	1	0	0
		Corduliidae	0	0	0	0	0	0	0	1	0	0	0
Damselflies	Zygoptera	Coenagrionidae	19	14	24	29	0	0	8	26	59	17	15
		Calopterygidae	0	0	0	0	0	0	0	0	0	0	0
True water bugs	Hemiptera	Gerridae	0	0	0	0	0	0	0	0	0	0	0
		Hebridae	0	0	0	0	0	0	0	0	0	0	0
		Naucoridae	0	0	0	0	0	0	0	1	0	0	0
		Saldidae	0	0	0	1	0	0	0	0	0	0	0
		Veliidae	0	0	0	0	0	0	0	0	1	2	0
Beetles	Coleoptera	Dytiscidae	6	0	0	0	0	0	0	0	0	0	0
		Elmidae	1	8	10	11	0	11	2	3	17	33	6
		Gyrinidae	14	0	0	0	0	0	0	0	0	0	0
		Haliplidae	0	2	1	0	0	0	0	0	0	0	0
		Hydrophilidae	5	4	6	7	0	0	0	1	0	0	0
Butterflies and Mothss	Lepidoptera	Crambidae	0	0	0	0	0	0	0	2	0	0	0
Midges and flies	Diptera	Ceratopogonidae	7	1	3	2	0	3	4	1	0	0	0
		Stratiomyidae	0	1	0	1	0	0	3	0	1	1	0
		Tipulidae	0	0	0	0	0	1	1	0	0	0	0
		Chironominae	54	10	22	26	0	5	15	43	188	52	35
		Tanypodinae	10	2	5	4	0	11	9	4	9	6	7
		Orthocladiinae	0	0	3	3	0	0	2	1	0	0	0
Number of Individuals			204	146	200	147	0	174	175	161	595	240	233

+=Potential new reference site, non-regulatory site

^ =Non-regulatory site

Table 20. Macroinvertebrate abundances collected at each sample site along Marine Creek, Overton Park Creek, and Little Fossil Creek during Fall 2019.

Common Name	Order	Family	MAR1	MAR2	MAR3	OVR1	OVR2	OVR3	LFC1	LFC2	LFC3
Flatworms	Turbellaria		0	0	0	0	1	3	33	0	0
Worms	Oligochaeta	Lumbriculidae	0	0	0	0	0	1	0	0	0
		Tubificidae	0	4	3	0	2	0	0	0	0
		Naididae	0	0	0	0	0	1	0	0	0
Leeches	Hirudinea		0	7	1	2	5	4	19	1	1
Snails	Gastropoda	Physidae	0	9	3	63	0	13	34	19	39
		Planorbidae	0	5	0	0	0	0	74	5	14
		Lymnaeidae	0	8	0	0	0	0	0	4	0
		Hydrobiidae	0	0	0	0	0	0	0	0	0
		Ancylidae	0	3	0	0	0	1	0	4	2
Clams	Bivalvia	Corbiculidae	0	1	1	0	0	0	0	9	3
		Sphaeridae	0	0	0	0	0	0	1	4	0
Crawfish	Decapoda	Cambaridae	0	0	0	0	0	0	0	0	1
Scuds	Amphipoda	Hyallelidae	0	13	2	0	2	10	25	13	40
Mayflies	Ephemeroptera	Baetidae	0	2	31	26	47	28	2	2	2
		Caenidae	0	4	24	0	3	40	1	8	0
		Heptageniidae	0	0	0	0	0	0	0	0	0
		Leptophyphidae	0	0	0	0	0	0	0	8	0
Caddisflies	Trichoptera	Brachycentridae	0	0	0	0	0	1	0	0	0
		Helicopsychidae	0	0	10	0	0	14	1	14	0
		Hydropsychidae	0	2	15	3	22	0	0	0	0
		Hydroptilidae	0	0	12	1	1	6	0	2	0
		Leptoceridae	0	0	0	0	0	0	0	2	0
		Philopotamidae	0	0	2	2	10	27	0	1	0
		Odontoceridae	0	0	0	0	0	0	0	0	0

Table 20. Macroinvertebrate abundances collected at each sample site along Marine Creek, Overton Park Creek, and Little Fossil Creek during Fall 2019, continued.

Common Name	Order	Family	MAR1	MAR2	MAR3	OVR1	OVR2	OVR3	LFC1	LFC2	LFC3
Dragonflies	Anisoptera	Aeshnidae	0	0	0	0	0	0	0	0	0
		Gomphidae	0	0	0	0	0	0	0	0	0
		Libellulidae	0	0	0	3	0	1	0	0	0
		Corduliidae	0	0	0	0	0	0	0	0	0
Damselflies	Zygoptera	Coenagrionidae	0	2	8	61	12	23	5	12	10
		Calopterygidae	0	0	1	0	0	0	0	0	0
True water bugs	Hemiptera	Gerridae	0	0	0	1	0	0	0	0	0
		Hebridae	0	0	0	0	0	1	0	0	0
		Naucoridae	0	0	0	0	0	0	2	0	0
		Saldidae	0	0	0	0	0	0	0	0	0
		Veliidae	0	0	1	0	0	0	0	0	0
Beetles	Coleoptera	Dytiscidae	0	0	0	0	0	0	0	0	0
		Elmidae	0	10	13	0	0	1	1	10	2
		Gyrinidae	0	0	0	0	0	0	0	0	0
		Haliplidae	0	0	0	0	0	0	0	0	0
		Hydrophilidae	0	1	0	0	0	0	0	5	0
Butterflies and Mothss	Lepidoptera	Crambidae	0	0	1	0	1	0	0	0	0
Midges and flies	Diptera	Ceratopogonidae	0	0	0	1	0	4	5	0	1
		Stratiomyidae	0	0	0	0	0	2	0	2	0
		Tipulidae	0	0	0	1	0	1	1	1	0
		Chironominae	0	10	85	27	104	79	5	59	16
		Tanypodinae	0	1	9	4	31	14	5	6	4
		Orthocladiinae	0	3	2	4	0	0	0	14	1
Number of Individuals			0	85	224	199	241	275	214	205	136

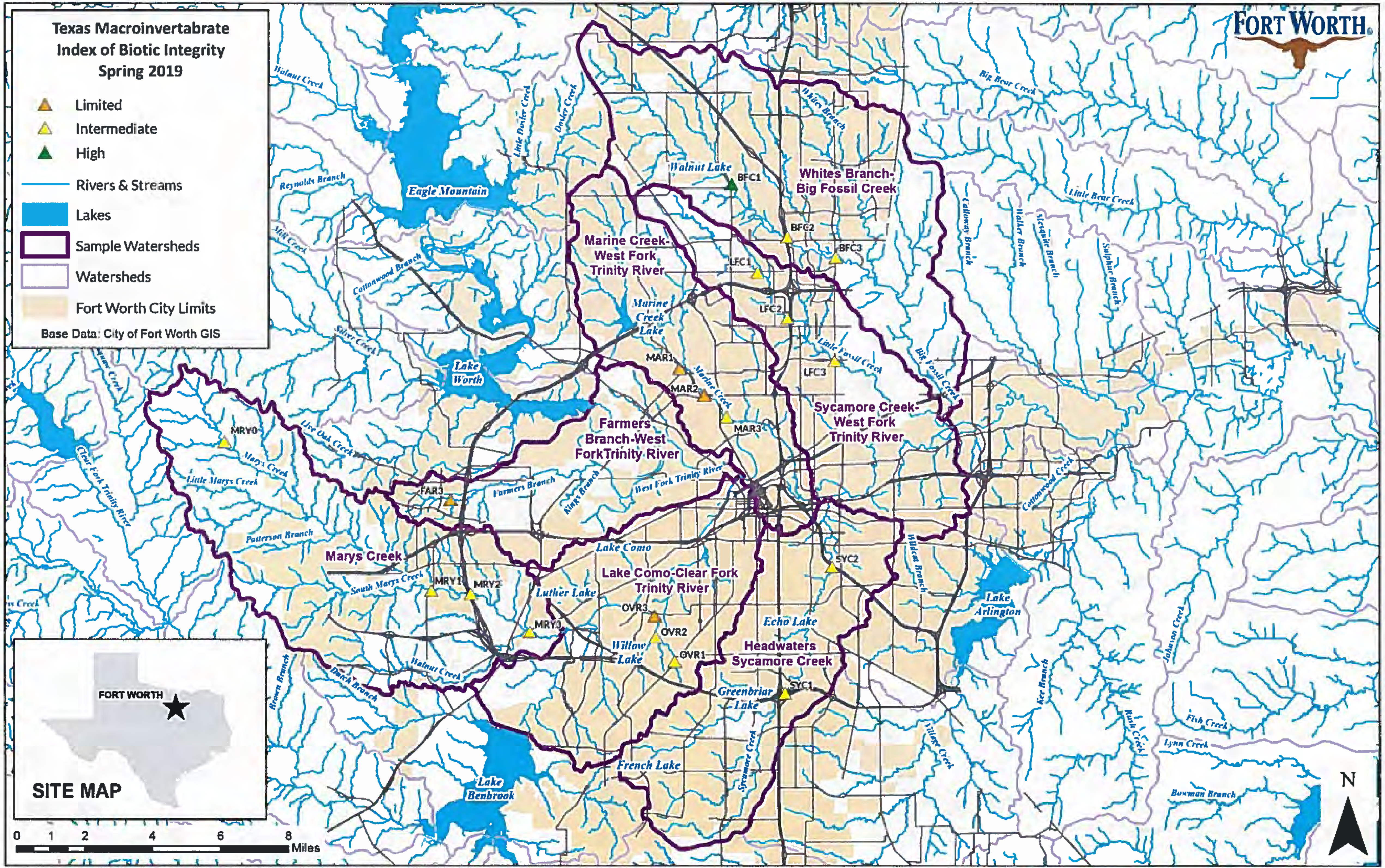

Figure 1. TX Macroinvertebrate IBI Aquatic Life Use Ratings, Spring 2019.

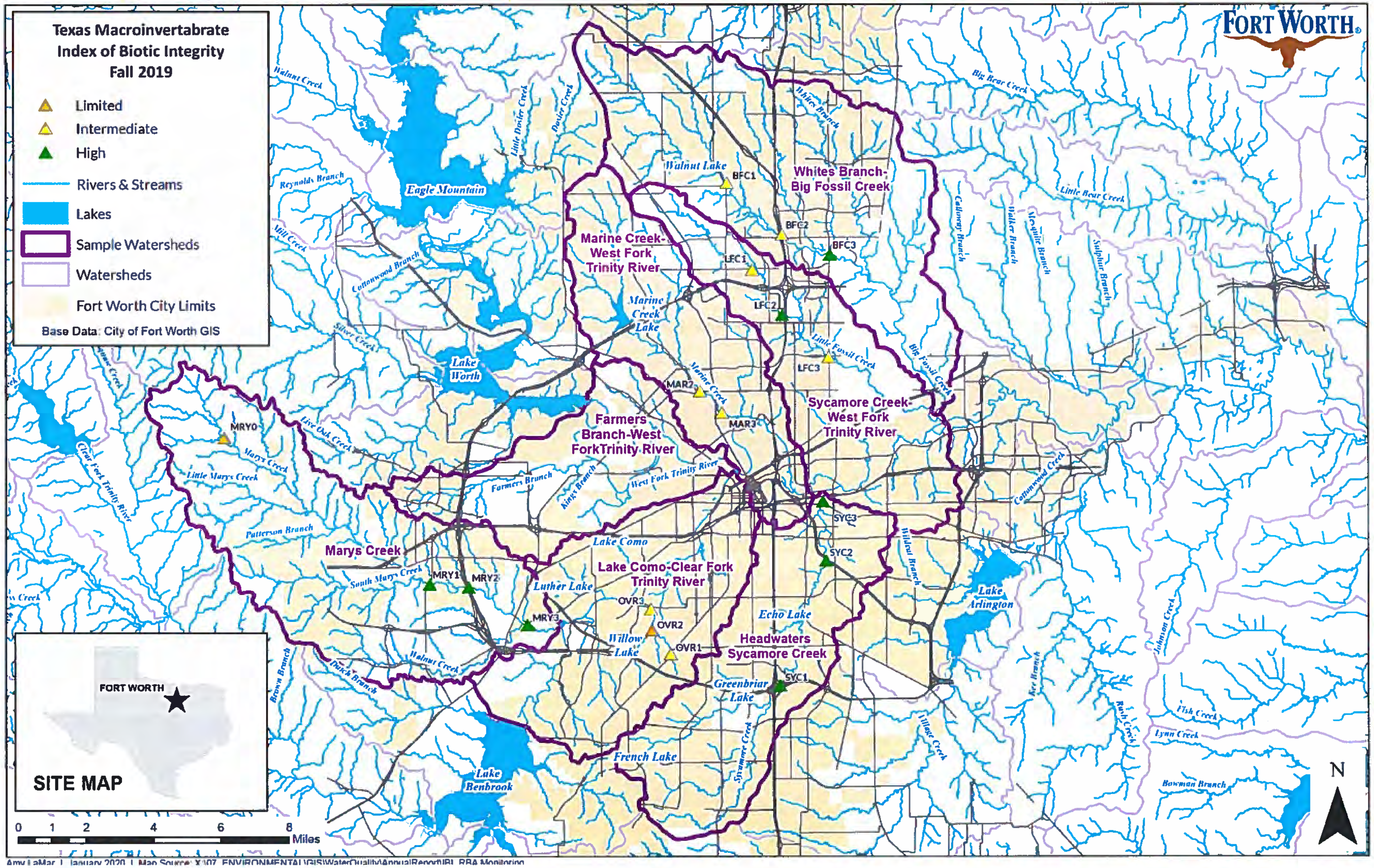

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Figure 2. TX Macroinvertebrate IBI Aquatic Life Use Ratings, Fall 2019.