# Red River Supply Response

# Williston, ND

# Environmental Sampling and Analysis Plan

# Version 1.1

Prepared On Behalf Of:

Prepared By:

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August 2, 2014

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## Management of Change

| Change 001 | | | |
|---|---|---|---|
| *Description of Change (include sections & page numbers):* Added Attachment B sampling table with updated analyte list which reduced the reporting list on 8260 and 8270 and includes BOD and COD to be sampled as needed. Section 4.2 page 4. Added 'If a significant rain event occurs, samples may be collected of stormwater runoff leaving site'. Added 'surface water sampling will be collected daily and will be re-assessed based on site operations and analytical data'. Added Attachment C surface water sample location map which goes from 12 surface water locations to 9 surface water locations. | | | |
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| Change 002 | | | |
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| *Description of Change (include sections & page numbers):* | | | |
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| Change 003 | | | |
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| | Name/Position | Signature | Date Signed |
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## 1.0 INTRODUCTION AND PURPOSE

This Sampling and Analysis Plan (SAP) was prepared on behalf of Garner Environmental supporting operations to provide environmental sampling work plans related to the Red River Incident in Williston, ND, which began on Tuesday July 22, 2014. A map of the site location is provided in Attachment A.

The incident involves Red River Supply, an oilfield field supply yard that was engulfed in a fire, consuming products that were stored onsite as well as releasing water from site that was used in fire suppression operations. The objectives of the environmental investigation and proposed sampling include:

1) The collection of water quality data and surface water, soil, and sediment samples to coarsely delineate areas of potential impact and asses the need for and effectiveness of the containment and cleanup activities.

2) The collection of background water quality data and surface water, soil, and sediment samples to develop the range of potential background concentrations for comparative purposes and to distinguish between target analytes related to this incident and non-related target analytes.

3) To collect water quality data and surface water, soil, sediment, and product samples as needed to support operations.

## 2.0 HEALTH AND SAFETY

CTEH® sampling personnel will review and adhere to the site specific Health and Safety Plan (HASP) developed by CTEH®. Sampling activities will only be completed in a safe manner and under safe conditions as dictated by the HASP.

## 3.0 DATA QUALITY OBJECTIVES

The data collected during field activities will be used to assess potential exposures to human health and the environment to constituents potentially related to the Red River Incident.

A strategic planning approach based on scientific method will be employed for data collection activities providing a systematic procedure to ensure the type, quantity and quality of data used in decision-making will be appropriate for the intended application. All samples will be submitted to Pace Analytical (Pace) located at 1700 Elm St., Minneapolis, MN 55414, for a Level II data quality package.

## 4.0 SURFACE WATER EVALUATION AND METHODOLOGY

### 4.1 Surface Water Monitoring

Surrounding drainage pathways and waterways downstream of the incident location will be visually inspected and photo-documented to note current status. Documentation produced will also note general conditions such as GPS coordinates, odors, water flow, weather, etc. General water quality readings will also be documented along all waterways both upgradient and downgradient of the release area to monitor the current status. Surface water monitoring will be conducted daily using Horiba U-52 (or similar) water quality meters. Meters will be calibrated per the manufacturers recommendation and monitoring will include the following parameters:

- Temperature
- pH
- Conductivity
- Dissolved Oxygen
- Turbidity
- ORP
- Salinity
- Total Dissolved Solids

### 4.2 Surface Water Samples

Surface water samples will be collected from runoff flowing offsite for characterization purposes. Containment measures have been deployed in an attempt to contain any site runoff. The site location's topography and geomorphology may be investigated to determine if runoff is escaping containment or entering any local waterways; if either case is found, a sample will be collected upstream and downstream of the runoff's confluence with the waterway. A representative number of surface water samples will be collected. See Appendix C for a map of surface water sampling locations. If a significant rain event occurs, samples may be collected of stormwater runoff leaving site. In addition to surface water samples, water column samples from mid depth and bottom depth may be collected from the Little Muddy River and the Missouri River if necessary. All sampling will be documented in field notebooks, CTEH® field forms, or hand-held devices, and surface water samples will be submitted to a laboratory in accordance with 40 CFR 136.

**Methodology and Analysis**

Surface water samples will be carefully decanted directly into laboratory supplied sample containers and submitted to a Pace, a NELAP-accredited laboratory. Water quality parameters including; pH, ORP, dissolved oxygen, conductivity, salinity, TDS, temperature, and turbidity will

be recorded for each surface water sample using a Horiba U-52 (or similar) water quality meter. Meters will be calibrated per the manufacturers recommendations.

CTEH® plans on initially submitting collected samples for analysis of:

- Volatile organic compounds (VOCs) by USEPA Method 8260
- Semi-volatile organic compounds by USEPA Method 8270
- Total Petroleum Hydrocarbons – Gasoline Range Organics, Diesel Range Organics, and Oil Range Organics by USEPA Method 8015
- Metals by USEPA 6010
- Herbicides by USEPA 8151
- Anions by Method 300.0
- Biological Oxygen Demand (BOD) by USEPA 405.1 (as needed for Waste Coordinator to evaluate treatment options if warranted)
- Chemical Oxygen Demand (COD) by USEPA410 (as needed for Waste Coordinator to evaluate treatment options if warranted)

After site runoff has been adequately characterized the analyte list may be reduced to reflect what chemicals of concern were actually released from site if any. Upon review of the initial analytical data, an analyte list will be finalized and surface water analyte table will be presented in Appendix B. .

**Location and Frequency**

Nine surface water samples will be collected daily. Location and frequency will be re-assessed based on site operations and analytical data. Any change in location or frequency frequency must be approved by the agencies onsite.

## 5.0 SOIL AND SEDIMENT SAMPLING METHODOLOGY AND ANALYSIS

### 5.1 Soil Samples

Soil samples will be collected from the release area in order to characterize possible impact. Additionally, soil samples will be collected as needed to support operations i.e prior to a decontamination area being constructed or standing up a staging area etc. All sampling will be documented in field notebooks, CTEH® field forms, or hand-held devices, and soil samples will be submitted to a laboratory in accordance with 40 CFR 136.

**Methodology and Analysis**

Soil samples from each location will be collected utilizing a stainless steel spoon. Each sample container will be completely filled to minimize headspace. Vegetation, rocks, litter, and other non-native soil material will be carefully removed prior to filling sample containers. All soil samples will be submitted to a Pace, a NELAP-accredited laboratory.

CTEH® plans on submitting collected soil samples for analysis of:

- Volatile organic compounds (VOCs) by USEPA Method 8260
- Semi-volatile organic compounds by USEPA Method 8270
- Total Petroleum Hydrocarbons – Gasoline Range Organics, Diesel Range Organics, and Oil Range Organics by USEPA Method 8015
- Metals by USEPA 6010 / 7040
- Herbicides by USEPA 8151
- Anions by Method 300.0

After site runoff has been adequately characterized the analyte list may be reduced to reflect what chemicals of concern were actually released from site if any. Upon review of the initial analytical data, an analyte list will be finalized and a soil sampling analyte table will be presented in Appendix B. Site specific screening levels will be developed for the chemicals of concern to help determine end point cleanup criteria.

**Location and Frequency**

Initially, soil samples will be collected from the release site once the area has been cleared by for sampling activities. Samples will also be collected in the areas around the release site to assess potential impact. A representative number of soil samples will be collected as needed to adequately characterize the site and support operations.

## 5.2 Sediment Samples

Sediment samples will be collected from preferential run off pathways from the release site and select stream sampling locations. Sediment samples will also be collected as needed to support operations. All sampling will be documented in field notebooks, CTEH® field forms, or hand-held devices, and Soil Samples will be submitted to a laboratory in accordance with 40 CFR 136.

**Methodology and Analysis**

Sediment samples from each location will be collected utlizing a stainless steel spoon, or a modified Van Veen type, self-tripping ponar sampling device (ponar). The overlaying water in the spoon or ponar sampling device will be carefully decanted off. Each sample container will be completely filled to minimize headspace. Vegetation, rocks, litter, and other non-native soil material will be carefully removed prior to filling sample containers. All sediment samples will be submitted to Pace, a NELAP-accredited laboratory.

CTEH® plans on submitting collected sediment samples for analysis of:

- Volatile organic compounds (VOCs) by USEPA Method 8260
- Semi-volatile organic compounds by USEPA Method 8270
- Total Petroleum Hydrocarbons – Gasoline Range Organics, Diesel Range Organics, and Oil Range Organics by USEPA Method 8015
- Metals by USEPA 6010

- Herbicides by USEPA 8151
- Anions by Method 300.0

After site runoff has been adequately characterized the analyte list may be reduced to reflect what chemicals of concern were actually released from site if any. Upon review of the initial analytical data, an analyte list will be finalized and a sediment sampling analyte table will be presented in Appendix B.

**Location and Frequency**

Initial sediment samples will be collected from the preferential run off pathways from the release site and at designated stream locations. A representative number of sediment samples will be collected to adequately characterize the site and support operations.

## 6.0 SAMPLE HANDLING PROCEDURES

Samples will be placed in laboratory supplied sample container and labeled with sample identification number, sample depth (for water column sampling), sampler name, sample date, analysis and methodology requested, and time of sample collection, and immediately placed in a cooler on ice pending laboratory analysis. Samples will be packaged, labeled, retained on ice, and documented in an area which is free of impact and provides for secure storage. Custody seals will be placed on each sample containing cooler, and chain-of-custody procedures will be maintained from the time of sample collection until arrival at the laboratory to protect sample integrity Shipping or transporting of samples to the laboratory will be done within a timeframe such that recommended holding times are met. Samples are being collected in adequate volumes in sample containers of a broad variety to ensure that any future requested analyses can be performed given the collected sample container types.

## 6.0 SAMPLE LABELING

Sample containers will be clearly labeled with the following information:

- Unique sample identification;
- Sample Type (discrete or composite, sediment and/or soil samples only)
- Sampler name or initials;
- Date sample collected; and
- Time sample collected;

The unique sample designation will include the following: sample type, two digit day, two digit month, two letter matrix prefix, two-digit numerical designation, and QA sample designation, as appropriate. The sample type will be SW surface water and SC for source sampling, SE for sediment sampling, WC for water column sampling and SL for soil.

Quality Assurance samples include MS (1 in 20 by media), MSD (1 in 20 by media), rinsate blank (RB) only when using non-dedicated sampling equipment, and duplicates (DUP) in 1 out of 10 samples by media. These samples are defined further below.

## 7.0 QUALITY ASSURANCE

Sampling will be carried out in conjunction with a well-defined quality assurance (QA) program. The goal of the field QA program is to document that samples are collected without the effects of accidental cross- or systematic contamination and refers to the sampling, analysis, and data validation procedures for generating valid and defensible data. To provide QA for the proposed sampling event, the following sampling, analysis, and data validation procedures will be performed:

### Field Calibration

Instruments used in the field as part of this sampling event are anticipated to consist of Horiba U-52 water quality meters, GPS units, digital cameras, and handheld data collection devices such as tablets/smart phones. Horibas will be calibrated daily. Other equipment is not are not anticipated to require field calibration. Operators of each piece of equipment are responsible for maintaining (including proper battery charge) and operating this equipment such that it conforms to each respective manufacturer's specifications.

### Field Duplicate Sample

For approximately every ten samples collected in the field, one field duplicate will be collected and submitted for laboratory analyses to verify the reproducibility of the sampling methods. Field duplicates will be prepared by separately submitting an aliquot from the same sample location to the laboratory for analysis consistent with the proscribed analyses.

### Field Split Samples

Field split samples refer to samples collected by the regulatory agency or its designee from the same sampling location and independently submitted to a different laboratory for analysis. Field split samples may be collected at the discretion of representatives of the regulatory agency or Incident Command.

### Laboratory QA

Laboratory quality control procedures will be conducted in a manner consistent with relevant State and federal regulatory guidance. Deliverables will contain the supporting documentation

necessary for data validation. Internal laboratory quality control checks will include method blanks, matrix spikes (and matrix spike duplicates), surrogate samples, calibration standards, and laboratory control standards (LCSs).

### Matrix Spike/Matrix Spike Duplicate Sample

Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples refer to field samples spiked with the analytes of interest prior to being analyzed at the laboratory to gauge the quality of analysis. Approximately one in twenty samples will be analyzed as MS/MSD samples.

### Data Validation

Validation of the data generated by the laboratory performing the analyses will include at a minimum sample holding times, accuracy, precision, contamination of field generated or laboratory method blanks, and surrogate compound recovery. Accuracy will be determined by evaluating LCS and MS recovery. Precision will be determined by evaluating laboratory and field duplicate samples. Level II data validation will be performed on 100% of submitted samples. Level IV data validation will be performed on at least 10% of submitted samples.

## 8.0 DECONTAMINATION PROCEDURES

Decontamination procedures refer to the steps undertaken to minimize the potential for offsite contamination and cross-contamination between individual sampling locations. Prior to collecting any sample for this release investigation, the following decontamination procedures will be undertaken: non-disposable sampling equipment such as Kemmerer water sampling devices which come into contact with sampling media will be decontaminated using a bristled brush and a solution comprised of a laboratory grade, non-phosphate detergent (e.g., Alconox or Liquinox) and deionized water. Depending on ancillary activities being conducted for the response to this release, the decontamination of sampling equipment will be conducted over poly sheeting at the sample location or in a nearby designated area. The sampling equipment to be decontaminated will first be placed in a bucket containing the detergent solution and thoroughly washed using a bristled brush. The items will then be transferred to the second 5-gallon bucket containing deionized water for rinsing. Following the initial rinsing, the item will be held over the third 5-gallon bucket while deionized water is carefully decanted over each item. Decontaminated items will be wrapped in clean aluminum foil for transit to the next sampling location.

Nitrile gloves will be worn by sampling personnel and changed between activities at each discrete sample collection location. Previously worn nitrile gloves will be discarded in appropriate waste receptacles with other PPE.

## 9.0 WASTE DISPOSAL

The method for storage and disposal of investigative derived waste materials will comply with applicable local, state, and federal regulations in a manner consistent with the Waste Management Plan.

## 10.0 DATA ANALYSIS

To assess the potential impact from contact with target analytes, the results of sampling will be reviewed for the presence/absence of these compounds. The concentrations of detected compounds will then be compared to appropriate regulatory standards. The results of laboratory analyses will be provided to IC.

## 11.0 RECORDS MANAGEMENT

Records management refers to the procedures for generating, controlling, and archiving project-specific records and records of field activities. Project records, particularly those that are anticipated to be used as evidentiary data, directly support current or ongoing technical studies and activities, and provide historical evidence needed for later reviews and analyses, will be legible, identifiable, retrievable and protected against damage, deterioration, or loss on a centralized electronic database. Handwritten records will be written in indelible ink. Records will likely include, but are not limited to, the following: bound field notebooks on pre-numbered pages, sample collection forms, personnel qualification and training forms, sample location maps, equipment maintenance and calibration forms, chain-of custody forms, maps and drawings, transportation and disposal documents, reports issued as a result of the work, procedures used, correspondences, and any deviations from the procedural records. Documentation errors will be corrected by drawing a single line through the error so it remains legible and will be initialed by the responsible individual, along with the date of change, and the correction will be written adjacent to the error.

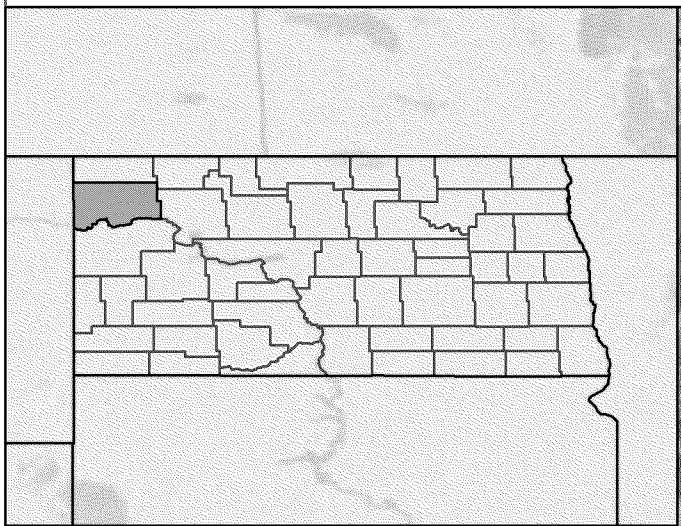
# Attachment A:

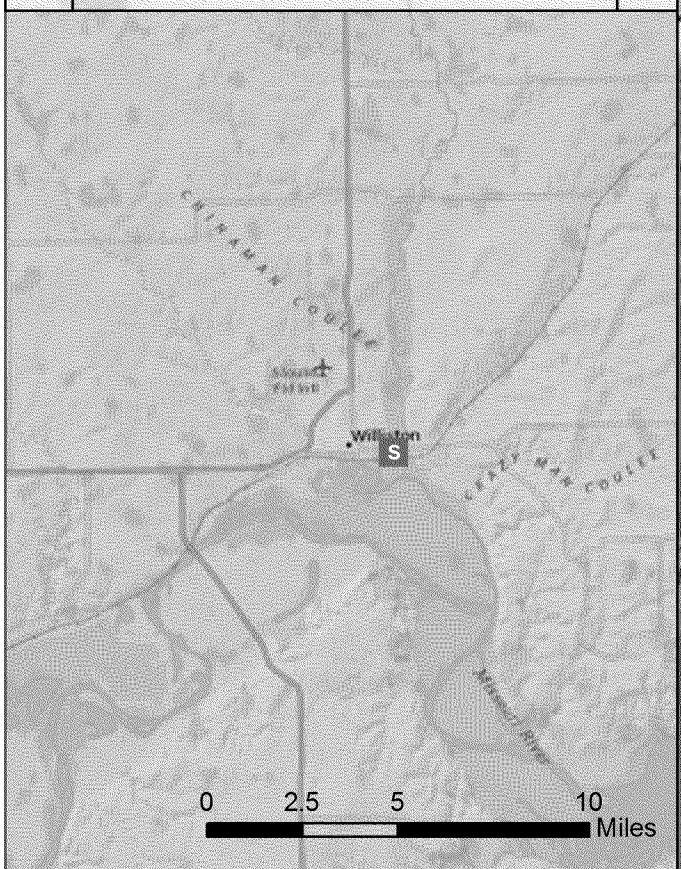
# Site Location Map

# Red River Supply - Williston, ND

## Site Location

Garner Project: 14N0114CA
CTEH Project: 106460
City: Williston, ND
County: Williams





PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *8/2/2014 8:47:43 AM*

# Attachment B:

# Sampling Analyte Table

| Analysis | Method | Containers | Preservative | Hold Time |
|---|---|---|---|---|
| Volatiles Organic Compounds (VOCs) - 2-Butanone (MEK), Benzene, Ethylbenzene, Toluene, Xylene (BTEX), Acetone, Napthalene, and Styrene only | 8260 | 3-40mL VOA vials | Preserved with HCl; maintained on ice until 4° C | 14 days |
| Semi-Volatile Organic Compounds (SVOCs) - 2-Nitrophenol, 4-Nitrophenol, 4,6-Dinitro-2-methylphenol, and Phenol only | 8270 | 1 – 1 L amber | Unpreserved; maintained on ice until 4° C | 7 days |
| Total Petroleum Hydrocarbons - Gasoline Range Organics (TPH-GRO) | 8015 | 3-40mL VOA vials | Preserved with HCl; maintained on ice until 4° C | 14 days |
| Total Petroleum Hydrocarbons - Diesel Range Organics (TPH-DRO) | 8015 | 1 – 1 L amber | Unpreserved; maintained on ice until 4° C | 7 days |
| Total Petroleum Hydrocarbons - Oil Range Organics (TPH-ORO) | 8015 | 1 – 1 L amber | Unpreserved; maintained on ice until 4° C | 7 days |
| Metals | 6010 / 7470 | 1 – 250mL plastic | Preserved with HNO3; maintained on ice until 4° C | 6 months / 28 days |
| Chlorinated Herbicides | 8151 | 1 – 1 L amber | Unpreserved; maintained on ice until 4° C | 7 days |
| Anions | 300.0 | 1 – 1 L plastic | Unpreserved; maintained on ice until 4° C | 7 days |
| Biological Oxygen Demand (BOD) – only as needed for Waste Coordinator to evaluate treatment options if warranted | 405.1 | 100mL | Unpreserved; maintained on ice until 4° C | 48 hours |
| Chemicall Oxygen Demand (BOD) – only as needed for Waste Coordinator to evaluate treatment options if warranted | 410 | 1 – 250mL plastic | Preserved with H2SO4; maintained on ice until 4° C | 28 days |
| Whole Effluent Toxicity (WET) Testing – 48 hr acute – as needed | 600 / 4-90 / 027F | 1 – gallon plastic | Unpreserved; maintained on ice until 4° C | |

# Appendix C:

# Surface Water Sample Location Map

# Williston, ND

## Proposed Surface Water Sampling Locations as of August 1, 2014 1600

Garner Project: 14N0114CA
CTEH Project: 106460
City: Williston, ND
County: Williams

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84* Print Date: *8/1/2014 4:08:12 PM*