



**Applied Water** CONSULTING LLC

PO. Box 7667 • Kalispell, Montana 59904 • Tel: 406 756-2550  
aapplied@centurytel.net • Fax: 406 756-0527

January 12, 2012

Kellie Danielson, CEcD  
Montana West Economic Development  
314 Main Street  
Kalispell, MT 59901

**Re: *Phase II Environmental Site Assessment Update for Knife River Property***  
***AWC Project No. 491.11***

Dear Kellie:

Find enclosed two copies of the subject-referenced report that describes the results of the Phase II Environmental Site Assessment update completed at the former McElroy and Wilken Gravel Pit in Kalispell, Montana. If you have any questions regarding these finding or other project management activities, please do not hesitate to contact me.

Sincerely,

Applied Water Consulting LLC

Roger A. Noble, P.G.  
Sr. Hydrogeologist

Enclosures: (2)

c: Alrick Hale w/enclosure

# Phase II Environmental Site Assessment Update

Knife River Property  
(former McElroy & Wilken Gravel Pit)  
Kalispell, Montana

January 12, 2012



Prepared For:

**Flathead Economic  
Development Authority**  
314 Main Street  
Kalispell, MT 59901

Prepared By:

  
**Applied Water**  
CONSULTING LLC  
Kalispell, MT 59901

**Phase II Environmental Site Assessment Update**

**Knife River Property  
(Former McElroy and Wilken Gravel Pit)  
Kalispell, Montana**

Prepared for:

Kellie Danielson  
Flathead Economic Development Authority  
314 Main Street  
Kalispell, MT 59901

Prepared by:

Applied Water Consulting, LLC  
P.O. Box 7667  
Kalispell, MT 59904

January 12, 2012

AWC Project No. 491.11

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>iii</b>
<b>1.0 INTRODUCTION.....</b>	<b>1</b>
1.1 Purpose .....	1
1.2 Detailed Scope-of-Services .....	2
1.3 Significant Assumptions .....	2
1.4 User Reliance .....	2
<b>2.0 SITE DESCRIPTION.....</b>	<b>3</b>
2.1 Location and Legal Description .....	3
2.2 Site and Vicinity General Characteristics.....	3
2.2.1 Local Setting .....	3
2.2.2 Topography.....	3
2.2.3 Geology and Hydrology .....	3
2.3 Current Use of the Property.....	5
<b>3.0 PHASE II INVESTIGATION AND RESULTS.....</b>	<b>7</b>
3.1 Oil-Water Separator REC .....	7
3.1.1 Soil Sample Laboratory Results.....	9
3.2 Septic Tank Closure .....	10
3.2.1 Office/Scale House Septic Tank Closure .....	10
3.2.2 Truck Repair Shop Septic System .....	11
3.3 High Capacity Well Plugging and Abandonment .....	11
3.4 Drum Removal and Disposition .....	12
3.5 Opencut Mine Permits .....	12
<b>4.0 LIMITATIONS AND EXCLUSIONS .....</b>	<b>13</b>
<b>5.0 REFERENCES.....</b>	<b>14</b>

**List of Figures**

Figure 1. Site Vicinity Map ..... 4  
Figure 2. Tank Limits of Excavation..... 8

**List of Tables**

Table 1. Summary of RCRA Metal Analyses..... 10

**List of Appendices**

- Appendix A. Photographic Journal
- Appendix B. Agency Correspondence
- Appendix C. Well Log Reports
- Appendix D. Soil Sample Laboratory Reports

## LIST OF ACRONYMS

AAI	all appropriate inquiry
ACM	asbestos containing materials
AMEC	AMEC Geomatrix Inc.
AMSL	above mean sea level
ASTM	American Society for Testing and Materials
AWC	Applied Water Consulting, LLC
CECRA	Comprehensive Environmental Cleanup and Responsibility Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CFR	Code of Federal Regulations
DEQ	Department of Environmental Quality
DOR	Department of Revenue
EPA	United States Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
ERNS	Emergency Response Notification System
ESA	environmental site assessment
FCHD	Flathead County Health Department
FCPZD	Flathead County Planning & Zoning Department
FOIA	U.S. Freedom of Information Act
FR	Federal Register
GWIC	Ground-Water Information Center
KPT	Kalispell Pole and Timber
KRC	Knife River Corporation
LNAPL	light non-aqueous phase liquids
LUST	leaking underground storage tank
MBMG	Montana Bureau of Mines and Geology
MSDS	material safety data sheet
NCP	national pollution discharge elimination system
NPL	National Priorities List (federal Superfund Facilities)
PCB's	polychlorinated biphenyls
PCP	pentachlorophenol
PRP	potentially responsible party
RCRA	Resource Conservation and Recovery Act
REC	recognized environmental concern
SARA	Superfund Amendments and Reauthorization Act of 1986
TSD	Treatment, Storage, Disposal (facilities for hazardous wastes)
USC	United States Code
USGS	United States Geological Survey
UST	underground storage tank

## EXECUTIVE SUMMARY

Applied Water Consulting (AWC) was retained by Flathead Economic Development Authority (FEDA) to update the original Knife River Property Phase I Environmental Site Assessment (ESA) in order to comply with the U.S. Environmental Protection Agency's (EPA) All Appropriate Inquiry (AAI) rules. The update identified one recognized environmental condition (REC) and four environmental concerns that were not previously disclosed. Therefore, a Phase II ESA was conducted to evaluate the potential environmental impacts associated with the REC and the other environmental issues. AWC investigated and addressed the following potential contaminant sources and/or environmental concerns as part of our Phase II tasks:

- An oil-water separator containing oily-water and sludge
- Closure of the onsite septic system serving the office/scale house
- Plugging and abandonment of a high-capacity industrial supply well
- Disposition of unlabeled 55-gallon drums

### Oil-Water Separator Removal and Closure

An oil-water separator, connected to both the floor drain in the truck repair shop and the exterior sump, is located adjacent to the northwest corner of the truck repair shop. The four chambers of the separator were full of oily-water and sludge at the time the Phase I ESA Update. The contents of both the exterior sump and the oil-water separator were pumped out and transported to Missoula, Montana for processing and recycling. The oil-water separator was excavated and removed on December 16, 2011. Inspection of the tank basin determined that no soil staining or odors were observed at the base of excavation. Two soil samples were collected beneath the bottom of the separator to document site conditions. A layer of gray to black stained soil was observed on the north wall of the excavation at a depth of 5 feet. Although the soil was discolored, it did not have a petroleum odor but rather a sewer odor. A third soil sample was collected from this area.

The results of the laboratory analyses for extractable petroleum hydrocarbons (EPH) reported the concentrations are below the fractionation threshold level of 200 mg/kg and therefore, no further analysis is necessary. The results of the laboratory analyses for a suite of volatile organic compounds (VOCs) reported all concentrations as not detected (ND) above the reporting limits. The results of the RCRA metals analyses were reported as ND or at concentrations substantially below Montana Tier 1 Risk-Based Screening Levels (RBSLs).

The concrete debris from both exterior sump and the oil-water separator tanks were determined to be nonhazardous materials and disposed at the Flathead County Landfill. The tank excavation was backfilled with clean pit-run fill material and graded to the surrounding land surface.

### Onsite Septic Tank Closure

The office/scale house building was razed as part of site cleanup activities. The content of the septic tank that serves this building were pumped out and the tank filled with clean pit-run backfill. The tank has been abandoned in accordance with Flathead County regulations for onsite sewage treatment systems.

### Plugging and Abandonment of a High-Capacity Industrial Supply Well

A high-capacity industrial supply well is located adjacent to the KRY CECRA site boundary. The well is completed in the alluvial aquifer and DEQ expressed concern that use of this well has the potential to alter the groundwater flow direction and draw contaminants from the KRY CECRA site onto the subject property. The drop pipe and pump were removed and the well casing was filled with granular bentonite chips from the bottom to the surface. A steel cap was welded on below grade in accordance with Montana Board of Water Well Contractor standards.

### Disposition of Unlabeled 55-gallon Drums

Approximately 25, unlabeled 55-gallon drums were observed throughout the property. The drums are full or partially full for which the contents could not be determined. None of the drums appeared to be leaking. Knife River Corporation (KRC) personnel have transported the drums to the main operation plant located at 3131 Highway 2 East in Kalispell, Montana. The contents of the drums will be examined and characterized and the material either used or properly disposed.

The Phase II site assessment and closure tasks were successfully completed in accordance with applicable rules and guidelines. No further action is required with regard to the afore listed environmental concerns.

## 1.0 INTRODUCTION

Applied Water Consulting (AWC) was retained by Flathead Economic Development Authority (FEDA) to update the original Knife River Property Phase I Environmental Site Assessment (ESA) of the former McElroy and Wilken Gravel Pit located at 801 Whitefish Stage in Kalispell, Montana. The Phase I ESA Update identified one recognized environmental condition (REC) that was not previously documented in the original Phase I ESA (AECOM, March 2011). The additional REC includes:

- An oil-water separator, connected to both the floor drain in the truck repair shop and the exterior sump, is located adjacent to the northwest corner of the diesel shop. All four of the chambers were full of oily-water and sludge at the time the Phase I ESA update was conducted on December 2, 2011.

In addition, the update also disclosed the following four environmental issues of concern that were not previously described in the original Phase I ESA:

1. There are two onsite septic systems. It is intended to raze the office/scale house and therefore, the septic tank associated with this building should be properly abandoned.
2. Moriah Bucy, DEQ Project Officer for the KRY CECRA Site, recommended the high-capacity well along the northern margin of the subject property be properly plugged and abandoned. DEQ is concerned the use of this well has the potential to alter the groundwater flow direction and draw contaminants from the KRY CECRA site onto the subject property.
3. Approximately 25 unlabeled 55-gallon drums were observed throughout the premises. The drums are full or partially full for which the contents could not be determined.
4. There are two active Opencut Mine operating permits issued for the subject property that include the Wilcox Pit (Permit No. 30) and the Pack Pit (Permit No. 54). DEQ requires that the permittee demonstrate successful reclamation, which necessitates two growing seasons to establish a vegetative cover.

### 1.1 Purpose

The purpose of this ESA was to concurrently evaluate and remediate the one REC and the four environmental concerns listed above. The objective being to mitigate the potential environmental liability associated with the one REC and the four other environmental concerns. A sampling and analysis plan (SAP) was not prepared because of the short timeframe associated with completing this project. The methods and procedures followed applicable local and State rules and regulations for conducting this type of work.

## **1.2 Detailed Scope-of-Services**

The scope of work associated with the Phase II ESA includes the following four tasks:

1. Removal, assessment, and closure of the oil-water separator system in accordance with DEQ risk-based screening levels (RBSLs);
2. Closure of the septic tank that serves the office/scale house building in accordance with Flathead City-County Health Department (FCHD) requirements;
3. Plugging and abandonment of the high capacity industrial well in conformance with Montana Board of Water Well Contractor Standards;
4. Oversee removal of the 25 unlabeled 55-gallon drums distributed across the subject property; and
5. Prepare a Summary Report: that describes the methods and provides documentation of closure tasks.

The assessment followed the general procedures recommended by the American Society for Testing and Materials (ASTM) Phase II ESA Process E1903.

## **1.3 Significant Assumptions**

The scope of work proposed for this assessment was based on the following assumptions:

- At the request of Kellie Danielson, MWED, President/CEO, Phase II assessment and remediation activities were concurrently performed in order to meet the closing deadline and be eligible for funding from the U.S. Economic Development Administration (EDA).

## **1.4 User Reliance**

This ESA report is prepared for the express use of Flathead Economic Development Authority. Applied Water Consulting, LLC makes no representation or warranty, express or implied, that the condition of the Property on the date of this report is the same or similar to the condition of the Property on the date the Phase I ESA was performed. This report is not intended for use by other parties without the written consent of Flathead Economic Development Authority. Although, Flathead Economic Development Authority may release this report to third parties; however, such third party in using this report agrees that it shall have no legal recourse against Applied Water Consulting, LLC or its members.

## 2.0 SITE DESCRIPTION

The following section provides information relative to the location, land-use activities, and general physical characteristics of the site.

### 2.1 Location and Legal Description

The subject property is located at 801 Whitefish Stage Road in Kalispell, Montana. The property is located between Whitefish Stage on the west, extending to East Oregon Street on the eastern margin. The legal description is the N½ NW¼ of Section 8, Township 28 North, Range 21 West, P.M.M., Flathead County, Montana. A Site Vicinity Map showing the subject property relative to the general features in the Kalispell area is presented as **Figure 1**.

### 2.2 Site and Vicinity General Characteristics

#### 2.2.1 Local Setting

The subject property is located on the eastern margin of the Kalispell City limits (see **Figure 1**). The property is in an industrial complex that has been in use since the early 1900's. It was originally the site of a dam on the Stillwater River for a lumber mill. A post and pole company and masonry rock company continue operations in the area. The subject property was a gravel pit and concrete batch plant until aggregate materials were depleted about 5 years ago.

#### 2.2.2 Topography

The topography of the subject property is quite variable as a result of the historic gravel mining operations. The base elevation at the east end of the property is approximately 2920 feet above mean sea level (amsl), while the top of the headwall is at an elevation of about 3020 feet amsl. The primary topographic feature in the immediate area is the cut-slope of the gravel pit headwall that is now being reclaimed.

#### 2.2.3 Geology and Hydrology

The area in the vicinity of the subject property is geologically mapped as Quaternary older alluvium (Smith and others, 2004). These deposits consist of pebbles and cobbles in a sand matrix. The thickness varies from 10 to 100 feet, hence they provide an excellent source for construction aggregate.

Three distinctive hydrostratigraphic units are present at the KRY CECRA Site (Tetra Tech EM, Inc., March 2008). From the ground surface downward, these units can be described as:

PAGE FOR FIGURE 1

1. An unconfined aquifer composed of unconsolidated alluvium with discontinuous lenses of clays and/or silts;
2. A low-permeability confining unit composed of clayey gravelly silt and silty clay at the base of the unconfined aquifer; and
3. A confined aquifer system composed of unconsolidated alluvium underlying the low-permeability unit.

The water table in this area is relatively shallow, occurring at approximately 25 feet below the ground surface (AWC, December 15, 2011). The groundwater flow direction is from west to east at a hydraulic gradient of 0.01. The estimated groundwater seepage velocity ranges from 0.39 ft/day to 7.4 ft/day (Tetra Tech EM Inc., March 2008).

The nearest surface water body is the Stillwater River, which transects the northwest corner of the site (see **Figure 1**). The City of Kalispell and the Evergreen Water and Sewer District obtain their municipal water supply from deep groundwater wells that are generally not susceptible to surficial contamination.

### **2.3 Current Use of the Property**

The property has historically been used as a gravel pit and concrete batch plant, but these operations were discontinued about five years ago when the source material was depleted. There are five existing buildings located in the northwest corner of the property that include: 1) an office/scale building; 2) a tire shed; 3) a repair shop; 4) a Quonset storage shed; and 5) a batch plant building. The south and east portions of the property have been terraced and are level with the surrounding terrain and are at grade with the adjacent roads.

Both the office/scale building and the tire shed are wood-frame structures constructed slab-on-grade. The office was built circa 1978 and the tire shed is 1940's vintage. The repair shop is a steel-frame structure that is also completed slab-on-grade. This building contains an elongate floor drain that is connected to an external sump and oil-water separator system. The Quonset shed was locked and could not be inspected. The batch plant consists of a concrete building with three external steel silos used to store cement and aggregate mix.

The subject property is not within the Evergreen Water and Sewer District and utilizes three onsite wells for domestic and industrial uses and two onsite septic systems to dispose of wastewater. There are two wells adjacent to the concrete batch plant. The well on the east side is cased with 6-inch ID steel casing and provides potable water to the office/scale building and the diesel repair shop; GWIC #156636. The well is 260 feet deep and derives water from the deep artesian aquifer. This wellhead was recently damaged by a frontend loader. A second well is located on the west side of the batch plant in a small wellhouse. The well is cased with 8-inch

ID steel casing to a depth of 237 feet; GWIC #82151. This well served as the source of water for concrete batching. A third well is located along the north-central margin of the property adjacent to Seventh Avenue East North. This well is located on the west end of a concrete drive slab that was set up to fill water tenders. This well is cased with 10-inch ID steel casing to a depth of 42 feet; static water level was 20.5 feet below ground surface (bgs). The well location corresponds with GWIC #140433 based on the GPS coordinates. The DEQ has expressed concern about the use of this well because of the potential to draw groundwater contaminants from the KRY CECRA site.

The Flathead City County Health Department issued a septic system permit for the office/scale house on July 13, 1978. However, the septic system that serves the repair shop was apparently not permitted.

The repair shop and Quonset shed are currently leased to Butch Barber Trucking. The remainder of the site is being reclaimed as part of the release of the Open-Cut mining permit bond.

### **3.0 PHASE II INVESTIGATION AND RESULTS**

The following section describes the methods and procedures used by AWC to evaluate potential onsite impacts to the soil and groundwater and the remedial actions implemented to mitigate the REC and the four other environmental concerns. AWC utilized standard operating procedures (SAPs) applicable to the specific task that was undertaken.

#### **3.1 Oil-Water Separator REC**

An oil-water separator, connected to both the floor drain in the truck repair shop and the exterior sump, is located adjacent to the northwest corner of the diesel shop (see **Figure 2**). The oil-water separator consists of two concrete septic tanks that are plumbed together. Each tank contains an internal baffle, creating four individual chambers. All four chambers were full of oily-water and sludge at the time of the Phase I ESA site visit on December 2, 2011.

The contents of both the exterior sump and the oil-water separator were pumped out on December 13, 2011 by Arrow Power Vac of Missoula, Montana. The oily water and sludge material was transported to Missoula for processing and recycling. After removing the residual liquids, KRC personnel plugged the outlet pipe inside the truck repair shop with cement grout to seal it from connecting to the exterior sump or oil-water separator (see photograph no. 1 in Appendix A).

KRC personnel also excavated and demolished the concrete exterior sump. According to Lance Street, KRC Project Manager, the excavation was inspected by Heather Gratbo, Geomatrix AMEC, and deemed it was not necessary to collect a soil sample based on the Phase II ESA findings (AMEC, November 2011). AWC personnel observed that clean bedding material was encountered at the base of the exterior concrete sump.

KRC personnel used a John Deere excavator to exhume and expose the top of the oil-water separator cover (see photograph no. 2 in Appendix A). Upon determining the dimensions and layout of the separator, a trench was excavated adjacent to the north side to allow for inspection and further assessment (see photograph no. 3 in Appendix A). A number of knockouts are located at the top of each tank. It was determined the plastic seals were still intact and the knockouts did not appear to be leaking (see photograph no. 4 in Appendix A). The seal between the tank cover and reservoir was also found to be intact and there were no signs of leakage. Oil-water separator excavation proceeded by removing the concrete cover on each tank and then breaking the walls of the reservoir into manageable pieces that could be lifted by the excavator (see photograph nos. 5 and 6 in Appendix A).

PAGE FOR FIGURE 2

Inspection of the tank basin determined that no soil staining or odors were observed in the soil underlying the oil-water separator. A composite soil sample was collected beneath each tank at a depth of 10 feet below ground surface (bgs). The samples are respectively designated as Base of East Tank and Base of West Tank. A layer of gray to black stained soil was observed on the north wall of the excavation at a depth of 5 feet bgs (see photograph no. 8 in Appendix A). Although the soil was discolored, it did not have a petroleum odor but rather a sewer odor. A soil sample was collected from this area and designated as North Wall (see **Figure 2**). The three soil samples were shipped on ice with appropriate chain-of-custody documentation and seals to Energy Laboratories in Billings, Montana. The samples were submitted for the following analyses:

- Extractable Petroleum Hydrocarbons (EPH) MDEP Method
- Volatile Organic Compounds (VOC) by EPA Method 8260
- Resource Conservation and Recovery Act (RCRA) Metals by SW6010B

The concrete debris from both exterior sump and the oil-water separator tanks were determined to be nonhazardous materials by Mary Louise Hendrickson, Solid Waste Section – Licensing at DEQ. A copy of this determination e-mail is contained in **Appendix B**. Upon receiving approval from David Prunty, Flathead County Public Works Director, the concrete debris was transported and disposed at the Flathead County Landfill. The tank excavation was backfilled with clean pit-run fill material and graded to the surrounding land surface.

### 3.1.1 Soil Sample Laboratory Results

The results of the laboratory analyses are described in this section. Complete copies of the laboratory reports and chain-of-custody records are contained in **Appendix C**.

#### ***Extractable Petroleum Hydrocarbons***

The laboratory results of the EPH analyses for the sample collected from the Base of the East Tank was reported as not detected (ND) at the reporting limit. The results for the samples collected at the Base of West Tank and North Wall were reported at concentrations of 30 mg/kg and 130 mg/kg, respectively. These concentrations are below the fractionation threshold level of 200 mg/kg and therefore, no further analysis is necessary.

#### ***Volatile Organic Compounds***

The three samples were analyzed for a suite of VOCs by EPA Method 8260. The results of the laboratory analyses reported the entire list of VOCs as not detected above the reporting limits with one exception. Toluene was reported at an estimated value of 0.094 mg/kg in the sample from the North Wall. The RBSL for toluene is 60 mg/kg. The concentration reported is four orders of magnitude lower than the RBSL.

## RCRA Metals

The results of the RCRA metals analyses are summarized in Table 1. As shown, the results for cadmium, mercury, selenium, and silver were all reported as ND in all three samples. Measurable concentrations of arsenic, barium, chromium, and lead were reported but all concentrations are significantly below the respective RBSLs. In summary, the results of the RCRA metals analyses were all reported at concentrations substantially lower than any action level.

<b>Metal</b>	<b>Base of East Tank</b>	<b>Base of West Tank</b>	<b>North Wall @ 5 ft bgs</b>	<b>Screening Level</b>
Arsenic	5	ND	ND	40
Barium	54	41	60	820
Cadmium	ND	ND	ND	3.8
Chromium	7	6	6	280
Lead	10	8	35	400
Mercury	ND	ND	ND	1.0
Selenium	ND	ND	ND	2.6
Silver	ND	ND	ND	8.9

Screening Level from Montana Tier 1 Risk-Based Corrective Action Guidelines for Petroleum Releases, Montana Department of Environmental Quality, September 2009.

The soil sample results confirm the soil staining and odor associated with the sample collected from the north wall of the oil-water separator excavation is related to the wastewater from the septic tank serving the truck repair shop. The north lateral of the drain tile parallels the oil-water separator in this area.

### 3.2 Septic Tank Closures

There are two onsite septic systems. The FCHD issued a permit for the septic system associated with the office/scale house building, which was being razed at the time this assessment was conducted. The other septic system is located on the north side of the truck repair shop and is not permitted.

#### 3.2.1 Office/Scale House Septic Tank Closure

According to the FCHD regulations for onsite sewage treatment systems, a septic tank that is out of use is to either be removed or closed in place. The access hatch of the septic tank located at the office/scale house was removed and the contents of the tank were pumped out on December 12, 2011 by Ken Pederson Pumping, a licensed Montana septic pumper (DEQ License No. 501).

The tank was then filled with clean pit-run backfill using KRC equipment and supervised by Lance Streeter, KRC Project Manager. The tank has been abandoned in accordance with Flathead County regulations for onsite sewage treatment systems (October 21, 2011).

### 3.2.2 Truck Repair Shop Septic System

The septic tank for the onsite sewage treatment system that serves the truck repair shop is located on the northwest corner of the building (see **Figure 2**). The contents of the tank were pumped out by Ken Pederson Pumping on December 16, 2011. The tank appeared to be functioning and in working order.

During removal of the oil-water separator system, the north drain tile connected to the septic tank was inadvertently severed. AWC contacted the FCHD to determine if repairs or remedial action would be necessary. Mr. Dick Montgomery, P.E., Environmental Engineer, conducted an onsite inspection on December 21, 2011. Mr. Montgomery viewed both the interior wastewater facilities and the drainfield area and determined the remaining system will adequately serve the single restroom in the garage. A copy of Mr. Montgomery's correspondence is provided in **Appendix B**. Therefore, no further action is necessary at this time.

## 3.3 High Capacity Well Plugging and Abandonment

A high-capacity well is located adjacent to the KRY CECRA site boundary (GWIC ID #140533). The well was used to rapidly fill water trucks for dust suppression and other industrial needs. The well is equipped with a Goulds model 300-10L submersible pump. This pump is capable of producing 300 gallons per minute with the 10 horsepower motor.

The well is completed in the alluvial aquifer and DEQ expressed concern that use of this well has the potential to alter the groundwater flow direction and draw contaminants from the KRY CECRA site onto the subject property. Therefore, DEQ recommended that the well be plugged and abandoned.

Miles Erickson, a licensed Montana Well Driller (License No. WWC 384) was retained by KRC to permanently abandon the well in conformance with Montana Board of Water Well Contractor standards. The drop pipe and submersible pump were removed on December 14, 2011. The well was sounded and determined to be 42 feet deep with a static water level of 20.5 feet below the top of casing. The well casing was then filled with granular bentonite chips from the bottom to the surface. A steel cap was welded on below grade. A copy of the well abandonment log (GWIC ID #264134) is provided in **Appendix C**.

### **3.4 Drum Removal and Disposition**

Approximately 25, unlabeled 55-gallon drums were observed throughout the property. The drums are full or partially full for which the contents could not be determined. None of the drums appeared to be leaking.

KRC personnel have transported the drums to the main operation plant located at 3131 Highway 2 East in Kalispell, Montana. The contents of the drums will be examined and characterized and the material either used or properly disposed.

### **3.5 Opencut Mine Permits**

The Knife River Town Gravel Pit is regulated under the Opencut Mining Program of the Industrial and Energy Minerals Bureau of the DEQ. There are two active operating permits issued for the subject property that include the Wilcox Pit (Permit No. 30) and the Pack Pit (Permit No. 54). There are no current violations on record. Knife River is working closely with DEQ to conduct site reclamation. However, DEQ requires that the permittee demonstrate successful reclamation, which necessitates two growing seasons to establish a vegetative cover. Therefore, the earliest the opencut bond could be released and the permit closed is the summer of 2013. However, a partial bond release could be obtained to allow for construction on the pit floor. It is recommended that Knife River retain responsibility for site reclamation and release and closure of the two mine permits.

#### **4.0 LIMITATIONS AND EXCLUSIONS**

The conclusions presented in this report are professional opinions based on information obtained through a Phase II ESA. This report has been prepared for the sole use of Flathead Economic Development Authority and only for the expressed purpose of evaluating site conditions. Our conclusions are based on the conditions observed during our assessment and environmental records reasonably obtainable. Our conclusions are also partly based on information we obtained from third-party sources. While we have made efforts to substantiate third-party information, we cannot guarantee its completeness or accuracy.

This report does not offer any legal opinion or representation. Nor does it offer any interpretation of environmental laws, rules, regulations, or policies of federal, state, or local government agencies.

## 5.0 REFERENCES

- American Society for Testing & Materials (ASTM), 2005. *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, E 1527-05*.
- Barrie Appraisal and Consulting, LLC, September, *Appraisal and Summary Report for McElroy Pit Site, Whitefish Stage Road, Kalispell, Montana*; prepared for Flathead Economic Development Authority, 17p.
- MSE, Inc., October 1991, *Sampling and Analytical Results Report for the Kalispell Pole and Timber Site, Kalispell, Montana*; prepared for Montana Department of Health and Environmental Sciences.
- Montana Department of Environmental Quality, December 2007, *Proposed Cleanup Alternative for the Kalispell Pole and Timber, Reliance Refinery, and Yale Oil Corporation State Superfund Facilities, Kalispell, Montana*.
- Montana Department of Environmental Quality, June 2008, *Final Feasibility Study Report for KRY Site, Kalispell, Montana*; prepared for Tetra Tech EM Inc.
- Montana Department of Environmental Quality, June 2008, *Record of Decision for KRY Site, Kalispell, Montana*; prepared for Tetra Tech EM Inc.
- Olympus Technical Services, Inc., March 13, 2002, *Phase I Environmental Site Audit for McElroy and Wilken, Inc., Main Plant Site, Kalispell, Montana*; prepared for KRC Holdings, Inc. 13p.
- Pioneer Technical Services, December 2000, *Final Phase I Remedial Investigation Report for the Reliance Refinery Site, Kalispell, Montana*; prepared for Montana Department of Environmental Quality.
- Remediation Technologies, Inc., March 1998, *Supplemental Remedial Investigation Report, Kalispell Pole and Timber Site, Kalispell, Montana*; prepared for Kalispell Pole and Timber.
- Smith, Larry N., 2004, *Surficial Geologic Map of the Upper Flathead Valley of Northwestern Montana*; Montana Bureau of Mines and Geology Groundwater Assessment Atlas No. 2, Part B, Map No. 6
- Tetra Tech EM Inc., March 2008, *Final Remedial Investigation Report for Kalispell Pole and Timber, Reliance Refinery, and Yale Oil Facilities*, prepared for Montana Department of Environmental Quality.

Trihydro Corporation, October 2, 2009, *Remedial Action Work Plan for KRY Site, Kalispell, Montana*, prepared for Montana Department of Environmental Quality.

U.S. Environmental Protection, February 1992, *Preliminary Extent of Soil Contamination and Hydrogeologic Investigation, Kalispell Pole and Timber Site, Kalispell, Montana*; prepared for Roy F. Weston for USEPA.

U.S. Environmental Protection, 40 CFR Part 312 Standards and Practices for All Appropriate Inquiries and Notice of Public Meeting to Discuss Standards and Practices for All Appropriate Inquiries; Proposed Rules Federal Register / Vol. 69, No. 165 / Thursday, August 26, 2004

# Appendix A

---

## PHOTOGRAPHIC JOURNAL

---

*Phase II Environmental Site Assessment Update  
Knife River Town Pit (former McElroy and Wilken Gravel Pit)  
Kalispell, Montana*



Photograph No. 1 - View of floor drain sump inside Truck Repair Shop after being filled with concrete grout to seal-off flow to oil-water separator and exterior sump. Photo by AWC December 16, 2011.



Photograph No. 2 - Top of northwest corner of oil-water separator during initial stage of excavation. Note 2-foot riser on top of tank that is level with ground surface. Photo by AWC December 16, 2011.



Photograph No. 3 - View looking due west along length of oil-water separator. Note black discolored soils on right side (north wall) of excavation. Photo by AWC December 16, 2011.



Photograph No. 4 - Closeup view of knockout showing it is intact and has not leaked. Photo by AWC December 16, 2011.



Photograph No. 5 (left) - View toward the east showing extend of 4 compartment oil-water separator. Photo by AWC December 16, 2011.



Photograph No. 6 (right) - View toward the west showing subsurface soil conditions after east oil-water separator tank was removed. Photo by AWC December 16, 2011.



Photograph No. 7 - View of oil-water separator excavation and removal. The cover of the east tank has been removed. Photo by AWC December 16, 2011.



Photograph No. 8 - View of discolored soils on north wall of excavation. Black line in upper part of photograph is layer of asphalt from current road surface. Photo by AWC December 16, 2011.

## **Appendix B**

---

### **AGENCY CORRESPONDENCE**

---

*Phase II Environmental Site Assessment Update  
Knife River Town Pit (former McElroy and Wilken Gravel Pit)  
Kalispell, Montana*

## Roger Noble

---

**From:** Dick Montgomery [dickm@flathead.mt.gov]  
**Sent:** Monday, January 09, 2012 3:47 PM  
**To:** 'roger@appliedwater.net'  
**Subject:** Use of existing septic system @ Knife River

Roger,

Thanks for showing me what is left of the septic system which serves the Knife River Company garage facility adjacent to Whitefish Stage Road in Evergreen. It is my opinion that the remaining system will continue to adequately serve the remaining single restroom in the garage. Should plans to remove the garage change, we will have to revisit this issue at that time.

Sincerely,  
Dick M.

Richard T. Montgomery, P.E.  
Environmental (civil) Engineer  
Flathead City/County Health Dept.

**Roger Noble**

---

**From:** Hendrickson, Mary [MHendrickson@mt.gov]  
**Sent:** Friday, December 16, 2011 1:47 PM  
**To:** Roger Noble; 'David Prunty'  
**Cc:** Johnson, Iver; Hall, Mark (DEQ); Christensen, Brady  
**Subject:** RE: Knife River Laboratory Report

Good afternoon Roger and Dave,  
Thanks for your continued patience and for the additional information for clarification.  
Based on our internal review/discussions, the material is acceptable for disposal at the  
FCSWD Class II Landfill.  
Have a good weekend.  
Mary

Mary Louise Hendrickson  
Solid Waste Section - Licensing  
Montana DEQ - WUTMB  
PO Box 200901  
Helena, MT 59620-0901  
phone: 406-444-1808  
fax: 406-444-1374

---

## **Appendix C**

---

### **WELL LOG REPORTS**

---

*Phase II Environmental Site Assessment Update  
Knife River Town Pit (former McElroy and Wilken Gravel Pit)  
Kalispell, Montana*

**NOTICE >> This well abandons GWIC Id 140533. << NOTICE**

**Site Name: MCELROY & WILKEN SAND & GRAVEL**  
**GWIC Id: 264134**

**Section 7: Well Test Data**

Total Depth: 42  
 Static Water Level: 20.4  
 Water Temperature:

**Section 1: Well Owner**

**Owner Name**  
 MCELROY & WILKEN SAND & GRAVEL  
**Mailing Address**  
 WHITEFISH STAGE  
**City**                                      **State**                                      **Zip Code**  
 KALISPELL                                      MT                                      59901

*\* During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

**Section 2: Location**

<b>Township</b>	<b>Range</b>	<b>Section</b>	<b>Quarter Sections</b>			
28N	21W	8	NE¼	SE¼	NW¼	NW¼
<b>County</b>			<b>Geocode</b>			
FLATHEAD						
<b>Latitude</b>	<b>Longitude</b>		<b>Geomethod</b>	<b>Datum</b>		
48.209351	114.305663		UNKNOWN	NAD83		
<b>Ground Surface Altitude</b>			<b>Method</b>	<b>Datum</b>	<b>Date</b>	

**Section 8: Remarks**

THIS WELL WAS ORIGINALLY LOGGED UNDER GWIC ID: 140533. PUMP EQUIPMENT AND DROP PIPE WAS REMOVED, WELL WAS FILLED WITH BENTONITE CHIPS FROM BOTTOM TO SURFACE AND CAP WAS WELDED ON BELOW GRADE.

**Addition**                                      **Block**                                      **Lot**

**Section 9: Well Log**  
**Geologic Source**

Unassigned  
 Lithology Data

**Section 3: Proposed Use of Water**  
 UNKNOWN (1)

There are no lithologic details assigned to this well.

**Section 4: Type of Work**  
 Drilling Method: UNKNOWN

**Driller Certification**

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

**Section 5: Well Completion Date**  
 Date well completed: Thursday, August 11, 1983

**Section 6: Well Construction Details**  
 There are no borehole dimensions assigned to this well.  
**Casing**

From	To	Diameter	Wall		Pressure		Joint	Type
			Thickness	Rating	Rating	Joint		
1	42	10	0.275	300.0			WELDEDA53B	STEEL

There are no completion records assigned to this well.  
**Annular Space (Seal/Grout/Packer)**

<b>Name:</b> MILES ERICKSON
<b>Company:</b> MWC/VIKING PUMP
<b>License No:</b> WWC-586
<b>Date Completed:</b> 8/11/1983

There are no annular space records assigned to this well.

**MONTANA WELL LOG REPORT****Other Options**

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

[Plot this site on a topographic map](#)  
[View scanned well log \(7/24/2009 12:14:28 PM\)](#)

**Site Name: MCELROY AND WILKEN SAND & GRAVEL #1**  
**GWIC Id: 140433**

**Section 7: Well Test Data****Section 1: Well Owner****Owner Name**

MCELROY &amp; WILKEN SAND &amp; GRAVEL

**Mailing Address**

WHITEFISH STAGE RD

<b>City</b>	<b>State</b>	<b>Zip Code</b>
-------------	--------------	-----------------

Total Depth:  
 Static Water Level:  
 Water Temperature:

**Unknown Test Method \***

Yield \_ gpm.  
 Pumping water level \_ feet.  
 Time of recovery \_ hours.  
 Recovery water level \_ feet.

**Section 2: Location**

<b>Township</b>	<b>Range</b>	<b>Section</b>	<b>Quarter Sections</b>		
28N	21W	8	NE¼	SE¼	NW¼
			<b>Geocode</b>		
FLATHEAD					
<b>Latitude</b>	<b>Longitude</b>		<b>Geomethod</b>	<b>Datum</b>	
48.209351	114.305663		TRS-SEC	NAD83	
<b>Ground Surface Altitude</b>			<b>Method</b>	<b>Datum</b>	<b>Date</b>

*\* During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

**Addition****Block****Lot****Section 8: Remarks**

DID NOT CHECK SWL. NITRATE & PHOSPHATE TESTS MADE ALSO- RESULTS IN FIELD NOTES.

**Section 3: Proposed Use of Water**

UNKNOWN (1)

**Section 9: Well Log****Geologic Source**

Unassigned  
 Lithology Data

**Section 4: Type of Work**

Drilling Method: UNKNOWN

There are no lithologic details assigned to this well.

**Driller Certification**

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

**Section 5: Well Completion Date**

Date well completed: Thursday, August 11, 1983

**Section 6: Well Construction Details**

There are no borehole dimensions assigned to this well.  
 There are no casing strings assigned to this well.  
 There are no completion records assigned to this well.  
**Annular Space (Seal/Grout/Packer)**

There are no annular space records assigned to this well.

<b>Name:</b>
<b>Company:</b> UNKNOWN
<b>License No:</b> -
<b>Date Completed:</b> 8/11/1983

## Appendix D

---

### SOIL SAMPLE LABORATORY REPORTS

---

*Phase II Environmental Site Assessment Update  
Knife River Town Pit (former McElroy and Wilken Gravel Pit)  
Kalispell, Montana*



# ANALYTICAL SUMMARY REPORT

January 03, 2012

Applied Water Consulting LLC  
PO Box 7667  
Kalispell, MT 59904-7667

Workorder No.: B11121745  
Project Name: Knife River II

Energy Laboratories Inc Billings MT received the following 3 samples for Applied Water Consulting LLC on 12/20/2011 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B11121745-001	North Wall @ 5 ft bgs	12/16/11 14:30	12/20/11	Soil	Metals by ICP/ICPMS, Total or Soluble Mercury in Solid By CVAA EPH-Ultrasonic Extraction Meoh Extraction for Volatiles Hydrocarbons, Extractable Petroleum-Scrn Moisture Moisture Prep Percent Moisture Digestion, Total Metals Digestion, Mercury by CVAA Volatile Organics, Methanol Extraction 8260-Volatile Organic Compounds - Short List
B11121745-002	Base of East Tank @ 10 ft bgs	12/16/11 15:15	12/20/11	Soil	Same As Above
B11121745-003	Base of West Tank @ 10 ft bgs	12/16/11 15:45	12/20/11	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC  
**Project:** Knife River II  
**Lab ID:** B11121745-001  
**Client Sample ID** North Wall @ 5 ft bgs

**Report Date:** 01/03/12  
**Collection Date:** 12/16/11 14:30  
**Date Received:** 12/20/11  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
----------	--------	-------	------------	----	-------------	--------	--------------------

#### PHYSICAL CHARACTERISTICS

Moisture	11	wt%		0.2		SW3550A	12/21/11 10:00 / cmb
----------	----	-----	--	-----	--	---------	----------------------

#### METALS, TOTAL - EPA SW846

Arsenic	ND	mg/kg-dry		5		SW6010B	12/28/11 08:18 / rlh
Barium	60	mg/kg-dry		5		SW6010B	12/28/11 08:18 / rlh
Cadmium	ND	mg/kg-dry		1		SW6010B	12/28/11 08:18 / rlh
Chromium	6	mg/kg-dry		5		SW6010B	12/28/11 08:18 / rlh
Lead	35	mg/kg-dry		5		SW6010B	12/28/11 08:18 / rlh
Mercury	ND	mg/kg-dry		1		SW7471A	12/21/11 13:20 / jlw
Selenium	ND	mg/kg-dry		5		SW6010B	12/28/11 08:18 / rlh
Silver	ND	mg/kg-dry		5		SW6010B	12/28/11 08:18 / rlh

#### VOLATILE ORGANIC COMPOUNDS

Benzene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Bromobenzene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Bromochloromethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Bromodichloromethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Bromoform	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Bromomethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Carbon tetrachloride	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Chlorobenzene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Chloroethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
2-Chloroethyl vinyl ether	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Chloroform	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Chloromethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
2-Chlorotoluene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
4-Chlorotoluene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Chlorodibromomethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,2-Dibromoethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Dibromomethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,2-Dichlorobenzene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,3-Dichlorobenzene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,4-Dichlorobenzene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Dichlorodifluoromethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,1-Dichloroethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,2-Dichloroethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
cis-1,2-Dichloroethene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,1-Dichloroethene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
trans-1,2-Dichloroethene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,2-Dichloropropane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,3-Dichloropropane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
2,2-Dichloropropane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,1-Dichloropropene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj

**Report** RL - Analyte reporting limit.  
**Definitions:** QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC  
**Project:** Knife River II  
**Lab ID:** B11121745-001  
**Client Sample ID** North Wall @ 5 ft bgs

**Report Date:** 01/03/12  
**Collection Date:** 12/16/11 14:30  
**Date Received:** 12/20/11  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>VOLATILE ORGANIC COMPOUNDS</b>							
cis-1,3-Dichloropropene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
trans-1,3-Dichloropropene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Ethylbenzene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Methylene chloride	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Methyl ethyl ketone	ND	mg/kg-dry		4.5		SW8260B	12/23/11 15:14 / jrj
Styrene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,1,1,2-Tetrachloroethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,1,2,2-Tetrachloroethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Tetrachloroethene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Toluene	0.094	mg/kg-dry	J	0.23		SW8260B	12/23/11 15:14 / jrj
1,1,1-Trichloroethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,1,2-Trichloroethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Trichloroethene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Trichlorofluoromethane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
1,2,3-Trichloropropane	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Vinyl chloride	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
m+p-Xylenes	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
o-Xylene	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Xylenes, Total	ND	mg/kg-dry		0.23		SW8260B	12/23/11 15:14 / jrj
Surr: p-Bromofluorobenzene	88.0	%REC		78-160		SW8260B	12/23/11 15:14 / jrj
Surr: Dibromofluoromethane	92.0	%REC		70-132		SW8260B	12/23/11 15:14 / jrj
Surr: 1,2-Dichloroethane-d4	88.0	%REC		60-136		SW8260B	12/23/11 15:14 / jrj
Surr: Toluene-d8	95.0	%REC		75-138		SW8260B	12/23/11 15:14 / jrj

### EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN

Total Extractable Hydrocarbons	130	mg/kg-dry		11	200	SW8015M	12/21/11 18:55 / pbf
Surr: o-Terphenyl	77.0	%REC		40-140		SW8015M	12/21/11 18:55 / pbf

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

#### Report Definitions:

RL - Analyte reporting limit.

QCL - Quality control limit.

J - Estimated value. The analyte was present but less than the reporting limit.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

## LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC  
**Project:** Knife River II  
**Lab ID:** B11121745-002  
**Client Sample ID** Base of East Tank @ 10 ft bgs

**Report Date:** 01/03/12  
**Collection Date:** 12/16/11 15:15  
**Date Received:** 12/20/11  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Moisture	15	wt%		0.2		SW3550A	12/21/11 10:01 / cmb
<b>METALS, TOTAL - EPA SW846</b>							
Arsenic	5	mg/kg-dry		5		SW6010B	12/28/11 08:22 / rlh
Barium	54	mg/kg-dry		5		SW6010B	12/28/11 08:22 / rlh
Cadmium	ND	mg/kg-dry		1		SW6010B	12/28/11 08:22 / rlh
Chromium	7	mg/kg-dry		5		SW6010B	12/28/11 08:22 / rlh
Lead	10	mg/kg-dry		5		SW6010B	12/28/11 08:22 / rlh
Mercury	ND	mg/kg-dry		1		SW7471A	12/21/11 13:22 / jlw
Selenium	ND	mg/kg-dry		5		SW6010B	12/28/11 08:22 / rlh
Silver	ND	mg/kg-dry		5		SW6010B	12/28/11 08:22 / rlh
<b>VOLATILE ORGANIC COMPOUNDS</b>							
Benzene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Bromobenzene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Bromochloromethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Bromodichloromethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Bromoform	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Bromomethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Carbon tetrachloride	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Chlorobenzene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Chloroethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
2-Chloroethyl vinyl ether	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Chloroform	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Chloromethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
2-Chlorotoluene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
4-Chlorotoluene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Chlorodibromomethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,2-Dibromoethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Dibromomethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,2-Dichlorobenzene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,3-Dichlorobenzene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,4-Dichlorobenzene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Dichlorodifluoromethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,1-Dichloroethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,2-Dichloroethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
cis-1,2-Dichloroethene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,1-Dichloroethene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
trans-1,2-Dichloroethene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,2-Dichloropropane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,3-Dichloropropane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
2,2-Dichloropropane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,1-Dichloropropene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj

**Report** RL - Analyte reporting limit.  
**Definitions:** QCL - Quality control limit.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.

### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC  
**Project:** Knife River II  
**Lab ID:** B11121745-002  
**Client Sample ID** Base of East Tank @ 10 ft bgs

**Report Date:** 01/03/12  
**Collection Date:** 12/16/11 15:15  
**Date Received:** 12/20/11  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>VOLATILE ORGANIC COMPOUNDS</b>							
cis-1,3-Dichloropropene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
trans-1,3-Dichloropropene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Ethylbenzene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Methylene chloride	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Methyl ethyl ketone	ND	mg/kg-dry		4.7		SW8260B	12/23/11 15:40 / jrj
Styrene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,1,1,2-Tetrachloroethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,1,2,2-Tetrachloroethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Tetrachloroethene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Toluene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,1,1-Trichloroethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,1,2-Trichloroethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Trichloroethene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Trichlorofluoromethane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
1,2,3-Trichloropropane	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Vinyl chloride	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
m+p-Xylenes	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
o-Xylene	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Xylenes, Total	ND	mg/kg-dry		0.24		SW8260B	12/23/11 15:40 / jrj
Surr: p-Bromofluorobenzene	86.0	%REC		78-160		SW8260B	12/23/11 15:40 / jrj
Surr: Dibromofluoromethane	81.0	%REC		70-132		SW8260B	12/23/11 15:40 / jrj
Surr: 1,2-Dichloroethane-d4	78.0	%REC		60-136		SW8260B	12/23/11 15:40 / jrj
Surr: Toluene-d8	91.0	%REC		75-138		SW8260B	12/23/11 15:40 / jrj

### EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN

Total Extractable Hydrocarbons	ND	mg/kg-dry		12	200	SW8015M	12/21/11 17:11 / pbf
Surr: o-Terphenyl	76.0	%REC		40-140		SW8015M	12/21/11 17:11 / pbf

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

**Report Definitions:** RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.

## LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC  
**Project:** Knife River II  
**Lab ID:** B11121745-003  
**Client Sample ID** Base of West Tank @ 10 ft bgs

**Report Date:** 01/03/12  
**Collection Date:** 12/16/11 15:45  
**Date Received:** 12/20/11  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>PHYSICAL CHARACTERISTICS</b>							
Moisture	9.8	wt%		0.2		SW3550A	12/21/11 10:05 / cmb
<b>METALS, TOTAL - EPA SW846</b>							
Arsenic	ND	mg/kg-dry		5		SW6010B	12/28/11 08:25 / rlh
Barium	41	mg/kg-dry		5		SW6010B	12/28/11 08:25 / rlh
Cadmium	ND	mg/kg-dry		1		SW6010B	12/28/11 08:25 / rlh
Chromium	6	mg/kg-dry		5		SW6010B	12/28/11 08:25 / rlh
Lead	8	mg/kg-dry		5		SW6010B	12/28/11 08:25 / rlh
Mercury	ND	mg/kg-dry		1		SW7471A	12/21/11 13:25 / jlw
Selenium	ND	mg/kg-dry		5		SW6010B	12/28/11 08:25 / rlh
Silver	ND	mg/kg-dry		5		SW6010B	12/28/11 08:25 / rlh
<b>VOLATILE ORGANIC COMPOUNDS</b>							
Benzene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Bromobenzene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Bromochloromethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Bromodichloromethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Bromoform	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Bromomethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Carbon tetrachloride	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Chlorobenzene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Chloroethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
2-Chloroethyl vinyl ether	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Chloroform	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Chloromethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
2-Chlorotoluene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
4-Chlorotoluene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Chlorodibromomethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,2-Dibromoethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Dibromomethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,2-Dichlorobenzene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,3-Dichlorobenzene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,4-Dichlorobenzene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Dichlorodifluoromethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,1-Dichloroethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,2-Dichloroethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
cis-1,2-Dichloroethene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,1-Dichloroethene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
trans-1,2-Dichloroethene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,2-Dichloropropane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,3-Dichloropropane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
2,2-Dichloropropane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,1-Dichloropropene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj

**Report** RL - Analyte reporting limit.  
**Definitions:** QCL - Quality control limit.

MCL - Maximum contaminant level.  
 ND - Not detected at the reporting limit.



### LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC  
**Project:** Knife River II  
**Lab ID:** B11121745-003  
**Client Sample ID** Base of West Tank @ 10 ft bgs

**Report Date:** 01/03/12  
**Collection Date:** 12/16/11 15:45  
**Date Received:** 12/20/11  
**Matrix:** Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
<b>VOLATILE ORGANIC COMPOUNDS</b>							
cis-1,3-Dichloropropene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
trans-1,3-Dichloropropene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Ethylbenzene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Methyl tert-butyl ether (MTBE)	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Methylene chloride	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Methyl ethyl ketone	ND	mg/kg-dry		4.4		SW8260B	12/23/11 16:06 / jrj
Styrene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,1,1,2-Tetrachloroethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,1,2,2-Tetrachloroethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Tetrachloroethene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Toluene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,1,1-Trichloroethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,1,2-Trichloroethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Trichloroethene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Trichlorofluoromethane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
1,2,3-Trichloropropane	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Vinyl chloride	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
m+p-Xylenes	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
o-Xylene	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Xylenes, Total	ND	mg/kg-dry		0.22		SW8260B	12/23/11 16:06 / jrj
Surr: p-Bromofluorobenzene	94.0	%REC		78-160		SW8260B	12/23/11 16:06 / jrj
Surr: Dibromofluoromethane	91.0	%REC		70-132		SW8260B	12/23/11 16:06 / jrj
Surr: 1,2-Dichloroethane-d4	89.0	%REC		60-136		SW8260B	12/23/11 16:06 / jrj
Surr: Toluene-d8	99.0	%REC		75-138		SW8260B	12/23/11 16:06 / jrj

### EXTRACTABLE PETROLEUM HYDROCARBONS-SCREEN

Total Extractable Hydrocarbons	30	mg/kg-dry		11	200	SW8015M	12/21/11 18:03 / pbf
Surr: o-Terphenyl	76.0	%REC		40-140		SW8015M	12/21/11 18:03 / pbf

- Note: Total Extractable Hydrocarbons are defined as the total hydrocarbon responses regardless of elution time.

**Report Definitions:** RL - Analyte reporting limit.  
QCL - Quality control limit.

MCL - Maximum contaminant level.  
ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC

**Report Date:** 01/03/12

**Project:** Knife River II

**Work Order:** B11121745

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
<b>Method: SW6010B</b>										Analytical Run: ICP203-B_111227A	
<b>Sample ID: QCS</b>	7	Initial Calibration Verification Standard									12/27/11 11:14
Arsenic		0.808	mg/L	0.10	101	90	110				
Barium		0.817	mg/L	0.10	102	90	110				
Cadmium		0.393	mg/L	0.010	98	90	110				
Chromium		0.797	mg/L	0.050	100	90	110				
Lead		0.784	mg/L	0.050	98	90	110				
Selenium		0.781	mg/L	0.10	98	90	110				
Silver		0.391	mg/L	0.010	98	90	110				
<b>Sample ID: ICSA</b>	7	Interference Check Sample A									12/27/11 11:28
Arsenic		0.00317	mg/L	0.10		0	0				
Barium		0.000780	mg/L	0.10		0	0				
Cadmium		0.00187	mg/L	0.010		0	0				
Chromium		9.00E-05	mg/L	0.050		0	0				
Lead		0.0269	mg/L	0.050		0	0				
Selenium		-0.000330	mg/L	0.10		0	0				
Silver		-0.00133	mg/L	0.010		0	0				
<b>Sample ID: ICSAB</b>	7	Interference Check Sample AB									12/27/11 11:33
Arsenic		0.974	mg/L	0.10	97	80	120				
Barium		0.490	mg/L	0.10	98	80	120				
Cadmium		0.867	mg/L	0.010	87	80	120				
Chromium		0.454	mg/L	0.050	91	80	120				
Lead		0.932	mg/L	0.050	93	80	120				
Selenium		0.939	mg/L	0.10	94	80	120				
Silver		0.980	mg/L	0.010	98	80	120				
<b>Method: SW6010B</b>										Batch: 59440	
<b>Sample ID: MB-59440</b>	7	Method Blank							Run: ICP203-B_111227A		12/28/11 07:39
Arsenic		ND	mg/kg	0.4							
Barium		0.02	mg/kg	0.02							
Cadmium		0.02	mg/kg	0.007							
Chromium		ND	mg/kg	0.04							
Lead		ND	mg/kg	0.4							
Selenium		ND	mg/kg	0.3							
Silver		ND	mg/kg	0.2							
<b>Sample ID: LCS3-59440</b>	7	Laboratory Control Sample							Run: ICP203-B_111227A		12/28/11 07:47
Arsenic		328	mg/kg	5.0	96	72.3	106.4				
Barium		666	mg/kg	5.0	108	80.6	112.2				
Cadmium		131	mg/kg	1.0	96	73	105.1				
Chromium		74.8	mg/kg	5.0	98	72.8	109.1				
Lead		197	mg/kg	5.0	106	75.9	120				
Selenium		193	mg/kg	5.0	99	72.5	112.2				
Silver		73.4	mg/kg	5.0	106	67.8	112.8				

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC

**Report Date:** 01/03/12

**Project:** Knife River II

**Work Order:** B11121745

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> SW6010B <span style="float: right;">Batch: 59440</span>										
<b>Sample ID:</b> B11121790-001ADIL	7	Serial Dilution				Run: ICP203-B_111227A				12/28/11 08:48
Arsenic		4.14	mg/kg-dry	5.0		0	0		10	N
Barium		425	mg/kg-dry	5.0		0	0	0.6	10	
Cadmium		1.72	mg/kg-dry	1.0		0	0	6.0	10	
Chromium		20.6	mg/kg-dry	5.0		0	0	4.6	10	
Lead		41.8	mg/kg-dry	5.0		0	0		10	N
Selenium		2.83	mg/kg-dry	5.0		0	0		10	N
Silver		15.2	mg/kg-dry	5.0		0	0		10	N
<b>Sample ID:</b> B11121790-001APDS	7	Post Digestion/Distillation Spike				Run: ICP203-B_111227A				12/28/11 08:52
Arsenic		88.2	mg/kg-dry	5.0	89	75	125			
Barium		500	mg/kg-dry	5.0	77	75	125			
Cadmium		41.0	mg/kg-dry	1.0	83	75	125			
Chromium		101	mg/kg-dry	5.0	86	75	125			
Lead		114	mg/kg-dry	5.0	85	75	125			
Selenium		86.5	mg/kg-dry	5.0	87	75	125			
Silver		55.8	mg/kg-dry	5.0	84	75	125			
<b>Sample ID:</b> B11121790-001AMS3	7	Sample Matrix Spike				Run: ICP203-B_111227A				12/28/11 08:56
Arsenic		64.1	mg/kg-dry	5.0	69	75	125			S
Barium		488	mg/kg-dry	5.0		75	125			A
Cadmium		29.5	mg/kg-dry	1.0	64	75	125			S
Chromium		80.9	mg/kg-dry	5.0	70	75	125			S
Lead		94.9	mg/kg-dry	5.0	71	75	125			S
Selenium		61.9	mg/kg-dry	5.0	67	75	125			S
Silver		43.6	mg/kg-dry	5.0	63	75	125			S
<b>Sample ID:</b> B11121790-001AMSD3	7	Sample Matrix Spike Duplicate				Run: ICP203-B_111227A				12/28/11 09:00
Arsenic		62.7	mg/kg-dry	5.0	69	75	125	2.2	20	S
Barium		500	mg/kg-dry	5.0		75	125	2.5	20	A
Cadmium		29.0	mg/kg-dry	1.0	64	75	125	1.8	20	S
Chromium		81.4	mg/kg-dry	5.0	73	75	125	0.7	20	S
Lead		99.9	mg/kg-dry	5.0	78	75	125	5.2	20	
Selenium		59.6	mg/kg-dry	5.0	66	75	125	3.8	20	S
Silver		46.2	mg/kg-dry	5.0	71	75	125	5.9	20	S

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

N - The analyte concentration was not sufficiently high to calculate a RPD for the serial dilution test.



## QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC

**Report Date:** 01/03/12

**Project:** Knife River II

**Work Order:** B11121745

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> SW7471A								Analytical Run: HGCV201-B_111221A		
<b>Sample ID:</b> QCS	Initial Calibration Verification Standard									12/21/11 12:07
Mercury		0.00198	mg/kg	1.0	99	90	110			
<b>Method:</b> SW7471A								Batch: 59431		
<b>Sample ID:</b> MB-59431	Method Blank						Run: HGCV201-B_111221A			12/21/11 13:11
Mercury		0.00500	mg/kg	1.0						
<b>Sample ID:</b> LCS3-59431	Laboratory Control Sample						Run: HGCV201-B_111221A			12/21/11 13:14
Mercury		5.44	mg/kg	1.0	109	70	130			
<b>Sample ID:</b> B11121740-004ADIL	Serial Dilution						Run: HGCV201-B_111221A			12/21/11 13:18
Mercury		0.0784	mg/kg	1.0		0	0		20	
<b>Sample ID:</b> B11121747-002AMS3	Sample Matrix Spike						Run: HGCV201-B_111221A			12/21/11 13:31
Mercury		8.20	mg/kg	1.0	87	80	120			
<b>Sample ID:</b> B11121747-002AMSD3	Sample Matrix Spike Duplicate						Run: HGCV201-B_111221A			12/21/11 13:39
Mercury		8.91	mg/kg	1.0	95	80	120	8.2	30	

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC

**Report Date:** 12/28/11

**Project:** Knife River II

**Work Order:** B11121745

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: SW8260B</b>							Batch: 59448		
<b>Sample ID: Ics-59448</b>	Laboratory Control Sample			Run: CS5972A.I_111223A			12/23/11 14:22		
Benzene	1.02	mg/kg	0.20	102	70	127			
Bromobenzene	0.936	mg/kg	0.20	94	70	135			
Bromochloromethane	0.960	mg/kg	0.20	96	60	130			
Bromodichloromethane	0.824	mg/kg	0.20	82	56	136			
Bromoform	0.808	mg/kg	0.20	81	59	132			
Bromomethane	0.728	mg/kg	0.20	73	18	134			
Carbon tetrachloride	0.944	mg/kg	0.20	94	60	140			
Chlorobenzene	1.02	mg/kg	0.20	102	75	132			
Chlorodibromomethane	0.880	mg/kg	0.20	88	62	133			
Chloroethane	0.928	mg/kg	0.20	93	45	139			
Chloroform	0.928	mg/kg	0.20	93	62	132			
Chloromethane	0.896	mg/kg	0.20	90	41	138			
2-Chloroethyl vinyl ether	1.04	mg/kg	0.20	104	41	149			
1,2-Dibromoethane	0.976	mg/kg	0.20	98	60	135			
2-Chlorotoluene	0.936	mg/kg	0.20	94	74	135			
Dibromomethane	0.928	mg/kg	0.20	93	60	135			
1,2-Dichlorobenzene	0.960	mg/kg	0.20	96	70	130			
4-Chlorotoluene	0.968	mg/kg	0.20	97	75	136			
1,3-Dichlorobenzene	0.952	mg/kg	0.20	95	71	132			
1,4-Dichlorobenzene	0.992	mg/kg	0.20	99	71	131			
Dichlorodifluoromethane	0.944	mg/kg	0.20	94	31	123			
1,1-Dichloroethane	0.960	mg/kg	0.20	96	66	130			
1,2-Dichloroethane	0.920	mg/kg	0.20	92	51	140			
1,1-Dichloroethene	1.02	mg/kg	0.20	102	64	133			
cis-1,2-Dichloroethene	0.952	mg/kg	0.20	95	63	131			
trans-1,2-Dichloroethene	0.992	mg/kg	0.20	99	66	133			
1,2-Dichloropropane	0.936	mg/kg	0.20	94	60	130			
1,3-Dichloropropane	0.952	mg/kg	0.20	95	59	135			
2,2-Dichloropropane	1.07	mg/kg	0.20	107	39	157			
1,1-Dichloropropene	1.02	mg/kg	0.20	102	65	132			
cis-1,3-Dichloropropene	0.952	mg/kg	0.20	95	55	134			
trans-1,3-Dichloropropene	0.960	mg/kg	0.20	96	58	146			
Ethylbenzene	0.936	mg/kg	0.20	94	74	136			
Methyl tert-butyl ether (MTBE)	0.944	mg/kg	0.20	94	43	152			
Methyl ethyl ketone	8.96	mg/kg	4.0	90	43	148			
Methylene chloride	0.880	mg/kg	0.20	88	51	134			
Styrene	1.02	mg/kg	0.20	102	70	135			
1,1,1,2-Tetrachloroethane	0.888	mg/kg	0.20	89	35	156			
1,1,2,2-Tetrachloroethane	0.968	mg/kg	0.20	97	59	135			
Tetrachloroethene	0.880	mg/kg	0.20	88	64	139			
Toluene	1.02	mg/kg	0.20	102	73	137			
1,1,1-Trichloroethane	0.944	mg/kg	0.20	94	63	134			
1,1,2-Trichloroethane	1.02	mg/kg	0.20	102	56	136			

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC  
**Project:** Knife River II

**Report Date:** 12/28/11  
**Work Order:** B11121745

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: SW8260B</b>							Batch: 59448		
<b>Sample ID: Ics-59448</b>	Laboratory Control Sample			Run: CS5972A.I_111223A			12/23/11 14:22		
Trichloroethene	0.880	mg/kg	0.20	88	65	134			
Trichlorofluoromethane	1.02	mg/kg	0.20	102	48	140			
1,2,3-Trichloropropane	0.856	mg/kg	0.20	86	56	142			
Vinyl chloride	1.01	mg/kg	0.20	101	32	136			
m+p-Xylenes	1.94	mg/kg	0.20	97	75	136			
o-Xylene	0.992	mg/kg	0.20	99	72	134			
Surr: 1,2-Dichloroethane-d4			0.20	98	60	136			
Surr: Dibromofluoromethane			0.20	101	70	132			
Surr: p-Bromofluorobenzene			0.20	102	78	160			
Surr: Toluene-d8			0.20	108	75	138			
<b>Sample ID: mb-59448</b>	Method Blank			Run: CS5972A.I_111223A			12/23/11 14:48		
Benzene	ND	mg/kg	0.20						
Bromobenzene	ND	mg/kg	0.20						
Bromochloromethane	ND	mg/kg	0.20						
Bromodichloromethane	ND	mg/kg	0.20						
Bromoform	ND	mg/kg	0.20						
Bromomethane	ND	mg/kg	0.20						
Carbon tetrachloride	ND	mg/kg	0.20						
Chlorobenzene	ND	mg/kg	0.20						
Chlorodibromomethane	ND	mg/kg	0.20						
Chloroethane	ND	mg/kg	0.20						
Chloroform	ND	mg/kg	0.20						
Chloromethane	ND	mg/kg	0.20						
2-Chloroethyl vinyl ether	ND	mg/kg	0.20						
1,2-Dibromoethane	ND	mg/kg	0.20						
2-Chlorotoluene	ND	mg/kg	0.20						
Dibromomethane	ND	mg/kg	0.20						
1,2-Dichlorobenzene	ND	mg/kg	0.20						
4-Chlorotoluene	ND	mg/kg	0.20						
1,3-Dichlorobenzene	ND	mg/kg	0.20						
1,4-Dichlorobenzene	ND	mg/kg	0.20						
Dichlorodifluoromethane	ND	mg/kg	0.20						
1,1-Dichloroethane	ND	mg/kg	0.20						
1,2-Dichloroethane	ND	mg/kg	0.20						
1,1-Dichloroethene	ND	mg/kg	0.20						
cis-1,2-Dichloroethene	ND	mg/kg	0.20						
trans-1,2-Dichloroethene	ND	mg/kg	0.20						
1,2-Dichloropropane	ND	mg/kg	0.20						
1,3-Dichloropropane	ND	mg/kg	0.20						
2,2-Dichloropropane	ND	mg/kg	0.20						
1,1-Dichloropropene	ND	mg/kg	0.20						
cis-1,3-Dichloropropene	ND	mg/kg	0.20						

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC  
**Project:** Knife River II

**Report Date:** 12/28/11  
**Work Order:** B11121745

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: SW8260B</b>									
Batch: 59448									
<b>Sample ID: mb-59448</b>	Method Blank			Run: CS5972A.I_111223A			12/23/11 14:48		
trans-1,3-Dichloropropene	ND	mg/kg	0.20						
Ethylbenzene	ND	mg/kg	0.20						
Methyl tert-butyl ether (MTBE)	ND	mg/kg	0.20						
Methyl ethyl ketone	ND	mg/kg	4.0						
Methylene chloride	ND	mg/kg	0.20						
Styrene	ND	mg/kg	0.20						
1,1,1,2-Tetrachloroethane	ND	mg/kg	0.20						
1,1,2,2-Tetrachloroethane	ND	mg/kg	0.20						
Tetrachloroethene	ND	mg/kg	0.20						
Toluene	ND	mg/kg	0.20						
1,1,1-Trichloroethane	ND	mg/kg	0.20						
1,1,2-Trichloroethane	ND	mg/kg	0.20						
Trichloroethene	ND	mg/kg	0.20						
Trichlorofluoromethane	ND	mg/kg	0.20						
1,2,3-Trichloropropane	ND	mg/kg	0.20						
Vinyl chloride	ND	mg/kg	0.20						
m+p-Xylenes	ND	mg/kg	0.20						
o-Xylene	ND	mg/kg	0.20						
Xylenes, Total	ND	mg/kg	0.20						
Surr: 1,2-Dichloroethane-d4			0.20	105	60	136			
Surr: Dibromofluoromethane			0.20	107	70	132			
Surr: p-Bromofluorobenzene			0.20	115	78	160			
Surr: Toluene-d8			0.20	118	75	138			
<b>Sample ID: b11121745-003ams</b>	Sample Matrix Spike			Run: CS5972A.I_111223A			12/23/11 16:32		
Benzene	1.00	mg/kg-dry	0.22	90	70	127			
Bromobenzene	0.940	mg/kg-dry	0.22	85	70	135			
Bromochloromethane	0.923	mg/kg-dry	0.22	83	60	130			
Bromodichloromethane	0.827	mg/kg-dry	0.22	75	56	136			
Bromoform	0.783	mg/kg-dry	0.22	71	59	132			
Bromomethane	0.510	mg/kg-dry	0.22	46	18	134			
Carbon tetrachloride	0.958	mg/kg-dry	0.22	86	60	140			
Chlorobenzene	1.01	mg/kg-dry	0.22	91	75	132			
Chlorodibromomethane	0.885	mg/kg-dry	0.22	80	62	133			
Chloroethane	0.883	mg/kg-dry	0.22	80	45	139			
Chloroform	0.923	mg/kg-dry	0.22	83	62	132			
Chloromethane	0.896	mg/kg-dry	0.22	81	41	138			
2-Chloroethyl vinyl ether	1.03	mg/kg-dry	0.22	93	41	149			
1,2-Dibromoethane	0.976	mg/kg-dry	0.22	88	60	135			
2-Chlorotoluene	0.932	mg/kg-dry	0.22	84	74	135			
Dibromomethane	0.896	mg/kg-dry	0.22	81	60	135			
1,2-Dichlorobenzene	0.932	mg/kg-dry	0.22	84	70	130			
4-Chlorotoluene	0.932	mg/kg-dry	0.22	84	75	136			

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC

**Report Date:** 12/28/11

**Project:** Knife River II

**Work Order:** B11121745

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: SW8260B</b>									
Batch: 59448									
<b>Sample ID: b11121745-003ams</b>	Sample Matrix Spike			Run: CS5972A.I_111223A			12/23/11 16:32		
1,3-Dichlorobenzene	0.976	mg/kg-dry	0.22	88	71	132			
1,4-Dichlorobenzene	0.976	mg/kg-dry	0.22	88	71	131			
Dichlorodifluoromethane	0.868	mg/kg-dry	0.22	78	31	123			
1,1-Dichloroethane	0.949	mg/kg-dry	0.22	86	66	130			
1,2-Dichloroethane	0.905	mg/kg-dry	0.22	82	51	140			
1,1-Dichloroethene	1.03	mg/kg-dry	0.22	93	64	133			
cis-1,2-Dichloroethene	0.949	mg/kg-dry	0.22	86	63	131			
trans-1,2-Dichloroethene	0.985	mg/kg-dry	0.22	89	66	133			
1,2-Dichloropropane	0.923	mg/kg-dry	0.22	83	60	130			
1,3-Dichloropropane	0.994	mg/kg-dry	0.22	90	59	135			
2,2-Dichloropropane	1.02	mg/kg-dry	0.22	92	39	157			
1,1-Dichloropropene	1.05	mg/kg-dry	0.22	94	65	132			
cis-1,3-Dichloropropene	0.914	mg/kg-dry	0.22	82	55	134			
trans-1,3-Dichloropropene	0.940	mg/kg-dry	0.22	85	58	146			
Ethylbenzene	0.949	mg/kg-dry	0.22	86	74	136			
Methyl tert-butyl ether (MTBE)	0.914	mg/kg-dry	0.22	82	43	152			
Methyl ethyl ketone	12.2	mg/kg-dry	4.4	110	43	148			
Methylene chloride	0.870	mg/kg-dry	0.22	78	51	134			
Styrene	1.05	mg/kg-dry	0.22	94	70	135			
1,1,1,2-Tetrachloroethane	0.876	mg/kg-dry	0.22	79	35	156			
1,1,2,2-Tetrachloroethane	0.994	mg/kg-dry	0.22	90	59	135			
Tetrachloroethene	0.887	mg/kg-dry	0.22	80	64	139			
Toluene	1.01	mg/kg-dry	0.22	91	73	137			
1,1,1-Trichloroethane	0.949	mg/kg-dry	0.22	86	63	134			
1,1,2-Trichloroethane	1.01	mg/kg-dry	0.22	91	56	136			
Trichloroethene	0.923	mg/kg-dry	0.22	83	65	134			
Trichlorofluoromethane	1.01	mg/kg-dry	0.22	91	48	140			
1,2,3-Trichloropropane	0.846	mg/kg-dry	0.22	76	56	142			
Vinyl chloride	0.976	mg/kg-dry	0.22	88	32	136			
m+p-Xylenes	1.94	mg/kg-dry	0.22	88	75	136			
o-Xylene	1.00	mg/kg-dry	0.22	90	72	134			
Surr: 1,2-Dichloroethane-d4			0.22	87	60	136			
Surr: Dibromofluoromethane			0.22	89	70	132			
Surr: p-Bromofluorobenzene			0.22	89	78	160			
Surr: Toluene-d8			0.22	96	75	138			
<b>Sample ID: b11121745-003amsd</b>	Sample Matrix Spike Duplicate			Run: CS5972A.I_111223A			12/23/11 16:58		
Benzene	0.967	mg/kg-dry	0.22	87	70	127	3.6	20	
Bromobenzene	0.967	mg/kg-dry	0.22	87	70	135	2.8	20	
Bromochloromethane	0.905	mg/kg-dry	0.22	82	60	130	1.9	20	
Bromodichloromethane	0.896	mg/kg-dry	0.22	81	56	136	8.0	20	
Bromoform	0.798	mg/kg-dry	0.22	72	59	132	2.0	20	
Bromomethane	0.550	mg/kg-dry	0.22	50	18	134	7.5	20	

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC

**Report Date:** 12/28/11

**Project:** Knife River II

**Work Order:** B11121745

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: SW8260B</b>									
Batch: 59448									
<b>Sample ID:</b> b11121745-003amsd	Sample Matrix Spike Duplicate			Run: CS5972A.I_111223A				12/23/11 16:58	
Carbon tetrachloride	0.914	mg/kg-dry	0.22	82	60	140	4.7	20	
Chlorobenzene	0.985	mg/kg-dry	0.22	89	75	132	2.7	20	
Chlorodibromomethane	0.855	mg/kg-dry	0.22	77	62	133	3.4	20	
Chloroethane	0.885	mg/kg-dry	0.22	80	45	139	0.3	20	
Chloroform	0.887	mg/kg-dry	0.22	80	62	132	3.9	20	
Chloromethane	0.923	mg/kg-dry	0.22	83	41	138	2.9	20	
2-Chloroethyl vinyl ether	0.985	mg/kg-dry	0.22	89	41	149	4.4	20	
1,2-Dibromoethane	0.967	mg/kg-dry	0.22	87	60	135	0.9	20	
2-Chlorotoluene	0.949	mg/kg-dry	0.22	86	74	135	1.9	20	
Dibromomethane	0.868	mg/kg-dry	0.22	78	60	135	3.2	20	
1,2-Dichlorobenzene	0.976	mg/kg-dry	0.22	88	70	130	4.7	20	
4-Chlorotoluene	0.985	mg/kg-dry	0.22	89	75	136	5.6	20	
1,3-Dichlorobenzene	0.958	mg/kg-dry	0.22	86	71	132	1.8	20	
1,4-Dichlorobenzene	0.994	mg/kg-dry	0.22	90	71	131	1.8	20	
Dichlorodifluoromethane	0.876	mg/kg-dry	0.22	79	31	123	0.9	20	
1,1-Dichloroethane	0.923	mg/kg-dry	0.22	83	66	130	2.8	20	
1,2-Dichloroethane	0.867	mg/kg-dry	0.22	78	51	140	4.3	20	
1,1-Dichloroethene	0.994	mg/kg-dry	0.22	90	64	133	3.5	20	
cis-1,2-Dichloroethene	0.932	mg/kg-dry	0.22	84	63	131	1.9	20	
trans-1,2-Dichloroethene	0.967	mg/kg-dry	0.22	87	66	133	1.8	20	
1,2-Dichloropropane	0.896	mg/kg-dry	0.22	81	60	130	2.9	20	
1,3-Dichloropropane	0.976	mg/kg-dry	0.22	88	59	135	1.8	20	
2,2-Dichloropropane	0.958	mg/kg-dry	0.22	86	39	157	6.3	20	
1,1-Dichloropropene	0.994	mg/kg-dry	0.22	90	65	132	5.2	20	
cis-1,3-Dichloropropene	0.914	mg/kg-dry	0.22	82	55	134	0.0	20	
trans-1,3-Dichloropropene	0.923	mg/kg-dry	0.22	83	58	146	1.9	20	
Ethylbenzene	0.940	mg/kg-dry	0.22	85	74	136	0.9	20	
Methyl tert-butyl ether (MTBE)	0.923	mg/kg-dry	0.22	83	43	152	1.0	20	
Methyl ethyl ketone	12.6	mg/kg-dry	4.4	114	43	148	3.6	20	
Methylene chloride	0.863	mg/kg-dry	0.22	78	51	134	0.8	20	
Styrene	1.00	mg/kg-dry	0.22	90	70	135	4.3	20	
1,1,1,2-Tetrachloroethane	0.880	mg/kg-dry	0.22	79	35	156	0.5	20	
1,1,2,2-Tetrachloroethane	1.01	mg/kg-dry	0.22	91	59	135	1.8	20	
Tetrachloroethene	0.848	mg/kg-dry	0.22	76	64	139	4.5	20	
Toluene	0.976	mg/kg-dry	0.22	88	73	137	3.6	20	
1,1,1-Trichloroethane	0.923	mg/kg-dry	0.22	83	63	134	2.8	20	
1,1,2-Trichloroethane	0.976	mg/kg-dry	0.22	88	56	136	3.6	20	
Trichloroethene	0.887	mg/kg-dry	0.22	80	65	134	3.9	20	
Trichlorofluoromethane	0.994	mg/kg-dry	0.22	90	48	140	1.8	20	
1,2,3-Trichloropropane	0.866	mg/kg-dry	0.22	78	56	142	2.3	20	
Vinyl chloride	0.976	mg/kg-dry	0.22	88	32	136	0.0	20	
m+p-Xylenes	1.91	mg/kg-dry	0.22	86	75	136	1.8	20	
o-Xylene	0.967	mg/kg-dry	0.22	87	72	134	3.6	20	

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC

**Report Date:** 12/28/11

**Project:** Knife River II

**Work Order:** B11121745

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method:</b> SW8260B							Batch: 59448		
<b>Sample ID:</b> b11121745-003amsd	Sample Matrix Spike Duplicate			Run: CS5972A.I_111223A			12/23/11 16:58		
Surr: 1,2-Dichloroethane-d4			0.22	82	60	136			
Surr: Dibromofluoromethane			0.22	84	70	132			
Surr: p-Bromofluorobenzene			0.22	90	78	160			
Surr: Toluene-d8			0.22	91	75	138			

**Qualifiers:**

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

# QA/QC Summary Report

Prepared by Billings, MT Branch

**Client:** Applied Water Consulting LLC

**Report Date:** 12/28/11

**Project:** Knife River II

**Work Order:** B11121745

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
<b>Method: SW8015M</b> <span style="float: right;">Batch: 59414</span>									
<b>Sample ID: LCS-59414</b>	Laboratory Control Sample				Run: GCFID-FISON-B_111219B			12/21/11 00:49	
Total Extractable Hydrocarbons	210	mg/kg	10	102	60	140			
Surr: o-Terphenyl			0.17	94	40	140			
<b>Sample ID: MB-59414</b>	Method Blank				Run: GCFID-FISON-B_111219B			12/21/11 01:41	
Total Extractable Hydrocarbons	ND	mg/kg	10						
Surr: o-Terphenyl			0.17	87	40	140			
<b>Sample ID: B11121617-001AMS</b>	Sample Matrix Spike				Run: GCFID-FISON-B_111219B			12/21/11 04:16	
Total Extractable Hydrocarbons	640	mg/kg-dry	11	96	60	140			
Surr: o-Terphenyl			0.19	84	40	140			
<b>Sample ID: B11121617-001AMSD</b>	Sample Matrix Spike Duplicate				Run: GCFID-FISON-B_111219B			12/21/11 05:08	
Total Extractable Hydrocarbons	667	mg/kg-dry	11	107	60	140	4.2	20	
Surr: o-Terphenyl			0.19	84	40	140			

<b>Method: SW8015M</b> <span style="float: right;">Analytical Run: R177804</span>									
<b>Sample ID: CCV_1219FIS48r-S</b>	Continuing Calibration Verification Standard				12/21/11 07:43				
n-Nonane	7.29	mg/kg		109	75	125			
n-Decane	7.25	mg/kg		109	75	125			
n-Dodecane	6.91	mg/kg		104	75	125			
n-Tetradecane	6.61	mg/kg		99	75	125			
n-Hexadecane	6.68	mg/kg		100	75	125			
n-Octadecane	6.66	mg/kg		100	75	125			
n-Nonadecane	6.81	mg/kg		102	75	125			
n-Eicosane	6.67	mg/kg		100	75	125			
n-Docosane	6.81	mg/kg		102	75	125			
n-Tetracosane	7.02	mg/kg		105	75	125			
n-Hexacosane	7.01	mg/kg		105	75	125			
n-Octacosane	6.99	mg/kg		105	75	125			
n-Triacontane	7.04	mg/kg		106	75	125			
n-Hexatriacontane	7.09	mg/kg		106	75	125			
Surr: o-Terphenyl			0.17	97	75	125			

**Qualifiers:**

RL - Analyte reporting limit.

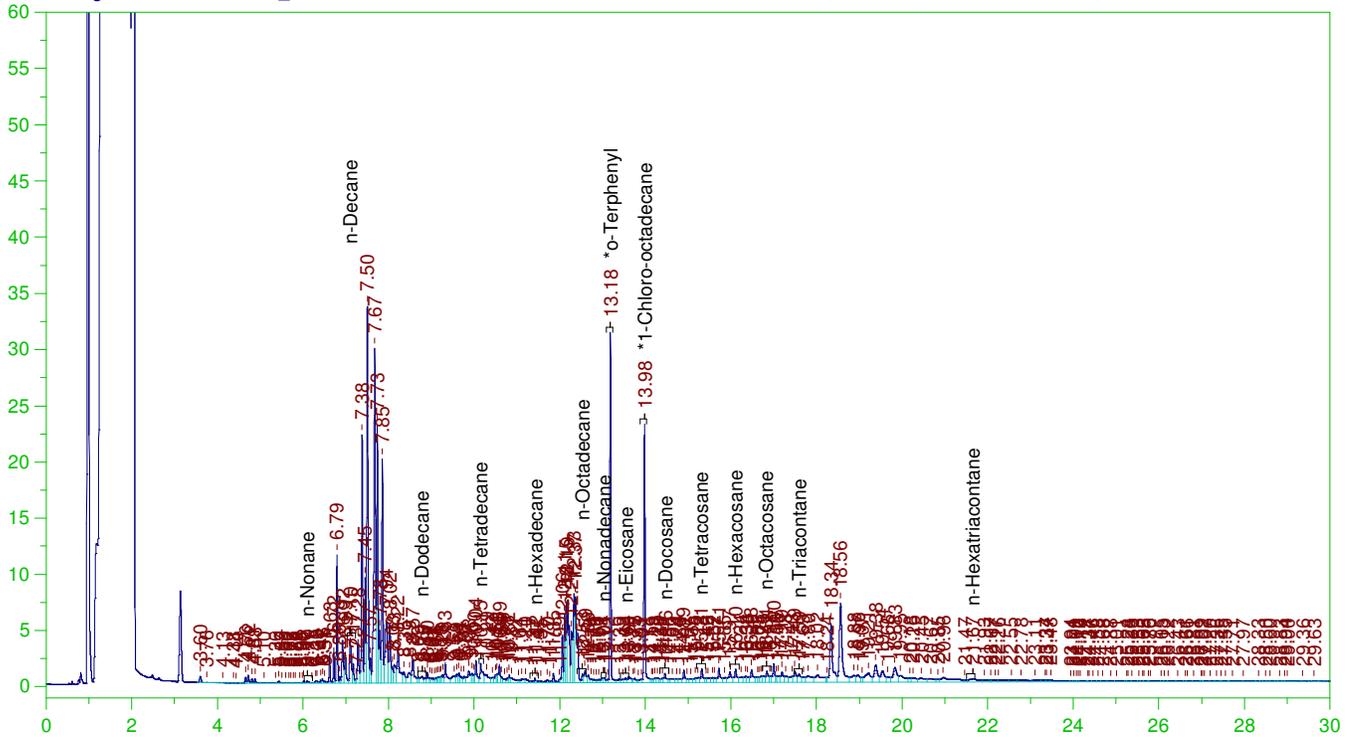
ND - Not detected at the reporting limit.

North Wall @ 5 ft bgs

Batch ID: 59414

G:\Org\FIS\DAT\FIS121911\_b\1219FIS.0058.RAW

B11121745-001A ;1219FIS , \$HC-EPH-SCRN-S,



**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: B11121745-001A ;1219FIS , \$HC-EPH-SCRN-S,  
Raw File: G:\Org\FIS\DAT\FIS121911\_b\1219FIS.0058.RAW  
Date & Time Acquired: 12/21/2011 6:55:35 PM  
Method File: G:\Org\FIS\Methods\S3000WV-L%.met  
Calibration File: G:\Org\FIS\Cals\SC090901WV.CAL  
Sample Weight: 30 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Hydrocarbons: 590.9753  
Mean RF for C19 to C36 Hydrocarbons: 537.3707  
Mean RF for Total Extractable Hydrocarbons: 564.173  
Rt range for Diesel Range Organics: 7.03 to 17.67  
Rt range for C9 to C18 Hydrocarbons: 6.03 to 13.095  
Rt range for C19 to C36 Hydrocarbons: 13.1325 to 21.71

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.184	6.667	5.328	79.92	-
*1-Chloro-octadecane	13.981	6.667	6.037	90.55	-

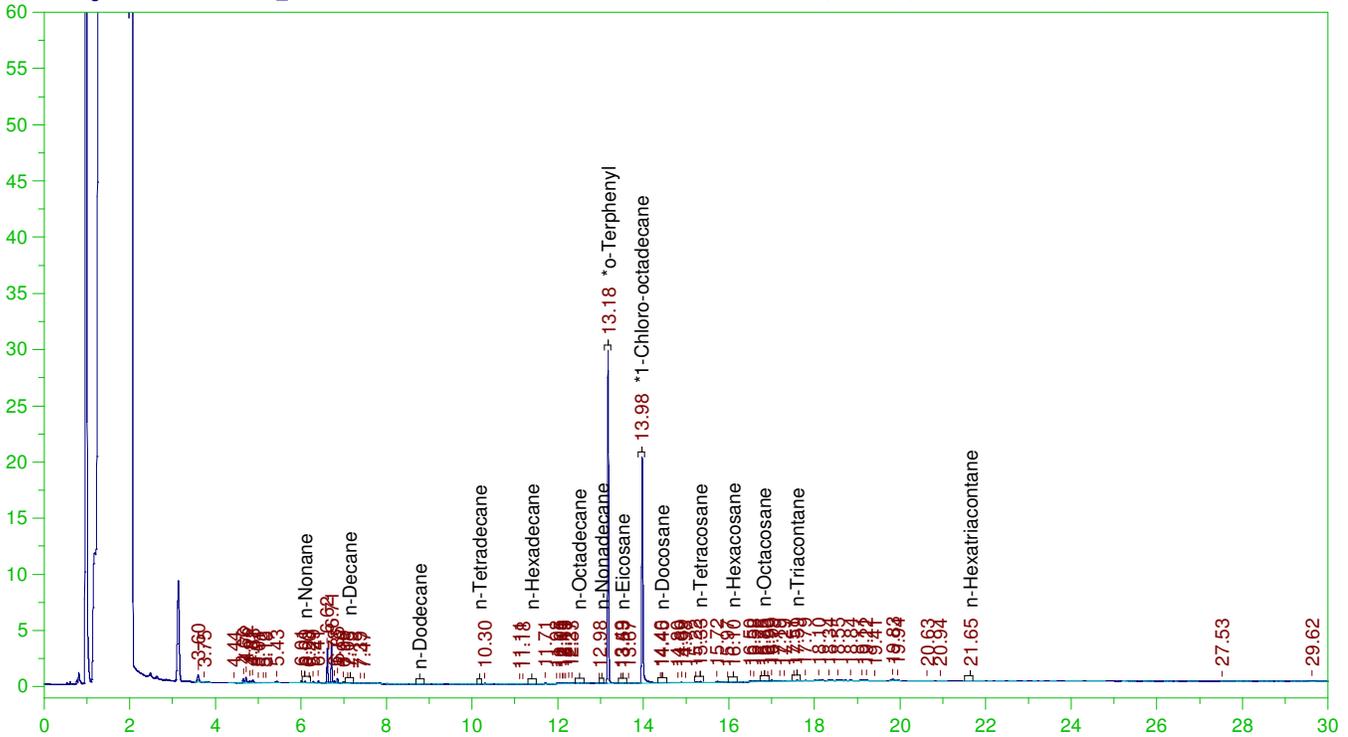
DRO Area:738347.1 DRO Amount: 87.24831  
TEH Area:977653.8 TEH Amount: 115.5265  
C9-C18 Area:674583.7 C9-C18 Amount: 76.09834  
C19-C36 Area:262176.5 C19-C36 Amount: 32.52583

Base of East Tank @ 10 ft bgs

Batch ID: 59414

G:\Org\FIS\DAT\FIS121911\_b\1219FIS.0056.RAW

B11121745-002A ;1219FIS , \$HC-EPH-SCRN-S,



**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: B11121745-002A ;1219FIS , \$HC-EPH-SCRN-S,  
Raw File: G:\Org\FIS\DAT\FIS121911\_b\1219FIS.0056.RAW  
Date & Time Acquired: 12/21/2011 5:11:31 PM  
Method File: G:\Org\FIS\Methods\SR000WV-L%.met  
Calibration File: G:\Org\FIS\Cals\SC090901WV.CAL  
Sample Weight: 30 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Hydrocarbons: 590.9753  
Mean RF for C19 to C36 Hydrocarbons: 537.3707  
Mean RF for Total Extractable Hydrocarbons: 564.173  
Rt range for Diesel Range Organics: 7.03 to 17.67  
Rt range for C9 to C18 Hydrocarbons: 6.03 to 13.095  
Rt range for C19 to C36 Hydrocarbons: 13.1325 to 21.71

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.178	6.667	5.066	76.	-
*1-Chloro-octadecane	13.976	6.667	5.467	82.	-

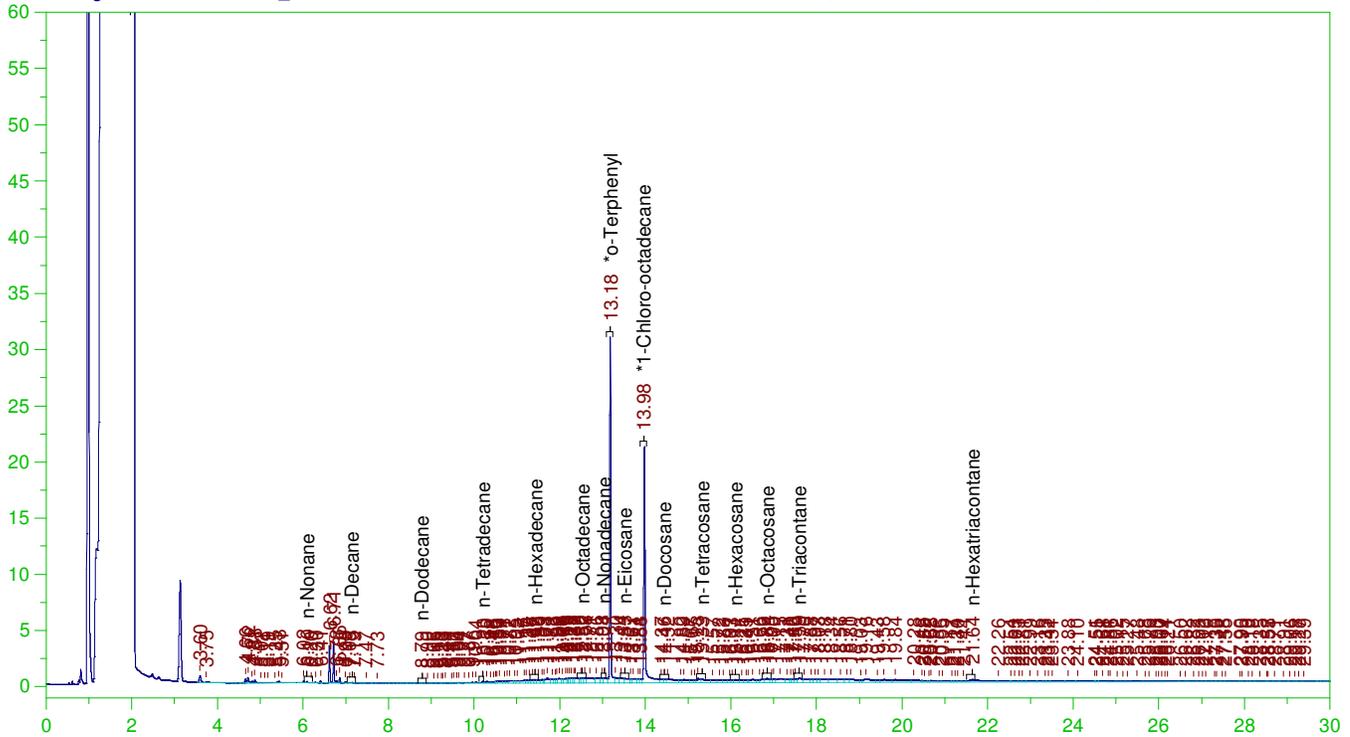
DRO Area:7350.543 DRO Amount: 0.868592  
TEH Area:29990.96 TEH Amount: 3.543944  
C9-C18 Area:16337.79 C9-C18 Amount: 1.843032  
C19-C36 Area:6360.121 C19-C36 Amount: 0.789042

Base of West Tank @ 10 ft bgs

Batch ID: 59414

G:\Org\FIS\DAT\FIS121911\_b\1219FIS.0057.RAW

B11121745-003A ;1219FIS , \$HC-EPH-SCRN-S,



**EXTRACTABLE PETROLEUM HYDROCARBONS (EPH) SCREENING ANALYSIS CHROMATOGRAM**

Sample Name: B11121745-003A ;1219FIS , \$HC-EPH-SCRN-S,  
Raw File: G:\Org\FIS\DAT\FIS121911\_b\1219FIS.0057.RAW  
Date & Time Acquired: 12/21/2011 6:03:34 PM  
Method File: G:\Org\FIS\Methods\S3000WV-L%.met  
Calibration File: G:\Org\FIS\Cals\SC090901WV.CAL  
Sample Weight: 30 Dilution: 2 S.A.: 1

Mean RF for C9 to C18 Hydrocarbons: 590.9753  
Mean RF for C19 to C36 Hydrocarbons: 537.3707  
Mean RF for Total Extractable Hydrocarbons: 564.173  
Rt range for Diesel Range Organics: 7.03 to 17.67  
Rt range for C9 to C18 Hydrocarbons: 6.03 to 13.095  
Rt range for C19 to C36 Hydrocarbons: 13.1325 to 21.71

SURROGATE COMPOUND	RT	ACTUAL	MEASURED	%REC	
*o-Terphenyl	13.181	6.667	5.452	81.78	-
*1-Chloro-octadecane	13.979	6.667	6.63	99.44	-

DRO Area:130241.2 DRO Amount: 15.39022  
TEH Area:231815.8 TEH Amount: 27.39298  
C9-C18 Area:74242.8 C9-C18 Amount: 8.375173  
C19-C36 Area:124697.1 C19-C36 Amount: 15.47003

# Workorder Receipt Checklist



B11121745

Login completed by: Randa Nees

Date Received: 12/20/2011

Reviewed by: BL2000\kmcDonald

Received by: jlh

Reviewed Date: 12/21/2011

Carrier Return-UPS  
name: Ground

- |   |   |                             |  |
|---|---|-----------------------------|--|
| Shipping container/cooler in good condition?  | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Not Present <input type="checkbox"/>                       |
| Custody seals intact on shipping container/cooler?  | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Not Present <input type="checkbox"/>                       |
| Custody seals intact on sample bottles?   | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/>            |
| Chain of custody present?   | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |  |
| Chain of custody signed when relinquished and received?   | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |  |
| Chain of custody agrees with sample labels?   | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |  |
| Samples in proper container/bottle?   | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |  |
| Sample containers intact?   | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |  |
| Sufficient sample volume for indicated test?  | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |  |
| All samples received within holding time?<br>(Exclude analyses that are considered field parameters<br>such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.) | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> |  |
| Container/Temp Blank temperature:   | 5.4°C On Ice                            |                             |  |
| Water - VOA vials have zero headspace?  | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | No VOA vials submitted <input checked="" type="checkbox"/> |
| Water - pH acceptable upon receipt?   | Yes <input type="checkbox"/>            | No <input type="checkbox"/> | Not Applicable <input checked="" type="checkbox"/>         |

-----  
Contact and Corrective Action Comments:

Run the same analysis on Base of East Tank @ 10 ft bgs per phone call with Roger Noble.

