Your Project #: 123512493
Site Location: TURNER VALLEY
Your C.O.C. #: TV - 1

**Attention: LINCOLN WELLER**

STANTEC CONSULTING LTD
#200, 325- 25TH ST. SE
CALGARY, AB
CANADA T2A 7H8

**Report Date: 2023/03/15**
Report #: R3310702
Version: 1 - Final

# CERTIFICATE OF ANALYSIS

**BUREAU VERITAS JOB #: C316001**
**Received: 2023/03/08, 10:53**

Sample Matrix: Water
# Samples Received: 1

| Analyses | Quantity | Date Extracted | Date Analyzed | Laboratory Method | Analytical Method |
|---|---|---|---|---|---|
| Alkalinity @25C (pp, total), CO3,HCO3,OH | 1 | N/A | 2023/03/09 | AB SOP-00005 | SM 23 2320 B m |
| BTEX/F1 in Water by HS GC/MS/FID | 1 | N/A | 2023/03/12 | AB SOP-00039 | CCME CWS/EPA 8260d m |
| F1-BTEX | 1 | N/A | 2023/03/13 | | Auto Calc |
| Cadmium - low level CCME - Dissolved | 1 | N/A | 2023/03/10 | | Auto Calc |
| Chloride/Sulphate by Auto Colourimetry | 1 | N/A | 2023/03/09 | AB SOP-00020 | SM23-4500-Cl/SO4-E m |
| Cyanide (total) | 1 | N/A | 2023/03/09 | CAL SOP-00270 | SM 23 4500-CN m |
| True Colour | 1 | N/A | 2023/03/09 | CAL SOP-00049 | SM 24 2120 C m |
| Conductivity @25C | 1 | N/A | 2023/03/09 | AB SOP-00005 | SM 23 2510 B m |
| Fluoride | 1 | N/A | 2023/03/09 | AB SOP-00005 | SM 23 4500-F C m |
| CCME Hydrocarbons in Water (F2; C10-C16) (1) | 1 | 2023/03/09 | 2023/03/09 | AB SOP-00037<br>AB SOP-00040 | CCME PHC-CWS m |
| Hardness | 1 | N/A | 2023/03/09 | | Auto Calc |
| Mercury (Dissolved) by CV (2) | 1 | 2023/03/09 | 2023/03/10 | AB SOP-00084 | BCMOE BCLM Oct2013 m |
| Elements by ICP - Dissolved (2) | 1 | N/A | 2023/03/09 | AB SOP-00042 | EPA 6010d R5 m |
| Elements by ICPMS - Dissolved (2) | 1 | N/A | 2023/03/09 | AB SOP-00043 | EPA 6020b R2 m |
| Elements by ICPMS - Dissolved (Ext List) | 1 | N/A | 2023/03/09 | AB SOP-00043 | EPA 6020b R2 m |
| Ion Balance | 1 | N/A | 2023/03/10 | | Auto Calc |
| Sum of cations, anions | 1 | N/A | 2023/03/09 | | Auto Calc |
| Nitrate and Nitrite | 1 | N/A | 2023/03/09 | | Auto Calc |
| NO2 (N); NO2 (N) + NO3 (N) in Water | 1 | N/A | 2023/03/09 | AB SOP-00091 | SM 24 4500 NO3m |
| Nitrate (as N) | 1 | 2023/03/08 | 2023/03/09 | | Auto Calc |
| Benzo[a]pyrene Equivalency (3) | 1 | N/A | 2023/03/10 | | Auto Calc |
| PAH in Water by GC/MS | 1 | 2023/03/09 | 2023/03/09 | AB SOP-00037 / AB SOP-00003 | EPA 3510C/8270E m |
| pH @25°C (4) | 1 | N/A | 2023/03/09 | AB SOP-00005 | SM 23 4500-H+B m |
| Total Dissolved Solids (Calculated) | 1 | N/A | 2023/03/10 | | Auto Calc |
| Total Kjeldahl Nitrogen (Total) | 1 | N/A | 2023/03/10 | BBY WI-00033 | Auto Calc |
| Nitrogen (Total) | 1 | 2023/03/10 | 2023/03/10 | AB SOP-00093 | SM 24 4500-N C m |
| Carbon (Total Organic) (5) | 1 | N/A | 2023/03/13 | AB SOP-00087 | MMCW 119 1996 m |
| Turbidity | 1 | N/A | 2023/03/09 | CAL SOP-00081 | SM 23 2130 B m |

**Remarks:**



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CALGARY, AB
CANADA T2A 7H8

**Report Date: 2023/03/15**
Report #: R3310702
Version: 1 - Final

# CERTIFICATE OF ANALYSIS

**BUREAU VERITAS JOB #: C316001**
**Received: 2023/03/08, 10:53**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Silica gel clean up employed.
(2) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(3) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.
(4) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.
(5) TOC present in the sample should be considered as non-purgeable TOC.

Encryption Key

AUTHORIZED REPORT
RAPPORT AUTORISÉ

Bureau Veritas
15 Mar 2023 15:17:57

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (780)577-7173
==========
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.



Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C316001
Report Date: 2023/03/15

STANTEC CONSULTING LTD
Client Project #: 123512493
Site Location: TURNER VALLEY

## RESULTS OF CHEMICAL ANALYSES OF WATER

| **Bureau Veritas ID** | | | BNB967 | BNB967 | | |
|---|---|---|---|---|---|---|
| **Sampling Date** | | | 2023/03/08 08:00 | 2023/03/08 08:00 | | |
| **COC Number** | | | TV - 1 | TV - 1 | | |
| | **UNITS** | **Criteria** | **PSBLEND** | **PSBLEND Lab-Dup** | **RDL** | **QC Batch** |
| **Calculated Parameters** | | | | | | |
| Anion Sum | meq/L | - | 5.3 | N/A | N/A | A902023 |
| Cation Sum | meq/L | - | 5.1 | N/A | N/A | A902023 |
| Hardness (CaCO3) | mg/L | - | 240 | N/A | 0.50 | A902649 |
| Ion Balance (% Difference) | % | - | 1.7 | N/A | N/A | A902651 |
| Nitrate (N) | mg/L | 10 | 0.10 | N/A | 0.010 | A902032 |
| Nitrate (NO3) | mg/L | - | 0.44 | N/A | 0.044 | A902031 |
| Nitrite (NO2) | mg/L | - | <0.033 | N/A | 0.033 | A902031 |
| Calculated Total Dissolved Solids | mg/L | 500 | 280 | N/A | 10 | A902063 |
| Total Total Kjeldahl Nitrogen (Calc | mg/L | - | <0.020 | N/A | 0.020 | A902331 |
| **Elements** | | | | | | |
| Dissolved Cadmium (Cd) | ug/L | 7 | <0.020 | N/A | 0.020 | A901974 |
| **Misc. Inorganics** | | | | | | |
| Conductivity | uS/cm | - | 470 | N/A | 2.0 | A904443 |
| Strong Acid Dissoc. Cyanide (CN) | mg/L | - | 0.00068 | N/A | 0.00050 | A903515 |
| pH | pH | 7:10.5 | 8.00 | N/A | N/A | A904441 |
| Total Organic Carbon (C) | mg/L | - | <0.50 | N/A | 0.50 | A907047 |
| **Anions** | | | | | | |
| Alkalinity (PP as CaCO3) | mg/L | - | <1.0 | N/A | 1.0 | A904438 |
| Alkalinity (Total as CaCO3) | mg/L | - | 170 | N/A | 1.0 | A904438 |
| Bicarbonate (HCO3) | mg/L | - | 210 | N/A | 1.0 | A904438 |
| Carbonate (CO3) | mg/L | - | <1.0 | N/A | 1.0 | A904438 |
| Dissolved Fluoride (F) | mg/L | 1.5 | 0.29 | N/A | 0.050 | A904445 |
| Hydroxide (OH) | mg/L | - | <1.0 | N/A | 1.0 | A904438 |
| Chloride (Cl) | mg/L | 250 | 1.0 | N/A | 1.0 | A903928 |
| Sulphate (SO4) | mg/L | 500 | 87 | N/A | 1.0 | A903928 |
| **Nutrients** | | | | | | |
| Nitrite (N) | mg/L | 1 | <0.010 | N/A | 0.010 | A904077 |
| Nitrate plus Nitrite (N) | mg/L | - | 0.10 | N/A | 0.010 | A904077 |
| Total Nitrogen (N) | mg/L | - | 0.11 | 0.10 | 0.020 | A905354 |

| | |
|---|---|
| No Fill | No Exceedance |
| Grey | Exceeds 1 criteria policy/level |
| Black | Exceeds both criteria/levels |

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable



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Bureau Veritas Job #: C316001
Report Date: 2023/03/15

STANTEC CONSULTING LTD
Client Project #: 123512493
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## RESULTS OF CHEMICAL ANALYSES OF WATER

| **Bureau Veritas ID** | | | BNB967 | BNB967 | | |
|---|---|---|---|---|---|---|
| **Sampling Date** | | | 2023/03/08 08:00 | 2023/03/08 08:00 | | |
| **COC Number** | | | TV - 1 | TV - 1 | | |
| | **UNITS** | **Criteria** | **PSBLEND** | **PSBLEND Lab-Dup** | **RDL** | **QC Batch** |
| **Physical Properties** | | | | | | |
| True Colour | PtCo units | 15 | <2.0 | N/A | 2.0 | A903795 |
| **Physical Properties** | | | | | | |
| Turbidity | NTU | - | 0.23 | N/A | 0.10 | A903814 |

| | |
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## PETROLEUM HYDROCARBONS (CCME)

| **Bureau Veritas ID** | | | BNB967 | | |
|---|---|---|---|---|---|
| **Sampling Date** | | | 2023/03/08 08:00 | | |
| **COC Number** | | | TV - 1 | | |
| | **UNITS** | **Criteria** | **PSBLEND** | **RDL** | **QC Batch** |
| **Ext. Pet. Hydrocarbon** | | | | | |
| F2 (C10-C16 Hydrocarbons) | mg/L | 1.1 | <0.10 | 0.10 | A902597 |
| **Surrogate Recovery (%)** | | | | | |
| O-TERPHENYL (sur.) | % | - | 92 | N/A | A902597 |

| | |
|---|---|
| No Fill | No Exceedance |
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## SEMIVOLATILE ORGANICS BY GC-MS (WATER)

| **Bureau Veritas ID** | | | BNB967 | | |
|---|---|---|---|---|---|
| **Sampling Date** | | | 2023/03/08 08:00 | | |
| **COC Number** | | | TV - 1 | | |
| | **UNITS** | **Criteria** | **PSBLEND** | **RDL** | **QC Batch** |
| **Polycyclic Aromatics** | | | | | |
| B[a]P TPE Total Potency Equivalent | mg/L | 0.00004 | <0.000010 | 0.000010 | A902037 |
| Acenaphthene | mg/L | 1.4 | <0.00010 | 0.00010 | A902879 |
| Acenaphthylene | mg/L | - | <0.00010 | 0.00010 | A902879 |
| Acridine | mg/L | - | <0.000040 | 0.000040 | A902879 |
| Anthracene | mg/L | - | <0.000010 | 0.000010 | A902879 |
| Benzo(a)anthracene | mg/L | - | <0.0000085 | 0.0000085 | A902879 |
| Benzo(b&j)fluoranthene | mg/L | - | <0.0000085 | 0.0000085 | A902879 |
| Benzo(k)fluoranthene | mg/L | - | <0.0000085 | 0.0000085 | A902879 |
| Benzo(g,h,i)perylene | mg/L | - | <0.0000085 | 0.0000085 | A902879 |
| Benzo(c)phenanthrene | mg/L | - | <0.000050 | 0.000050 | A902879 |
| Benzo(a)pyrene | mg/L | 0.00004 | <0.0000075 | 0.0000075 | A902879 |
| Benzo(e)pyrene | mg/L | - | <0.000050 | 0.000050 | A902879 |
| Chrysene | mg/L | - | <0.0000085 | 0.0000085 | A902879 |
| Dibenz(a,h)anthracene | mg/L | - | <0.0000075 | 0.0000075 | A902879 |
| Fluoranthene | mg/L | - | <0.000010 | 0.000010 | A902879 |
| Fluorene | mg/L | 0.94 | <0.000050 | 0.000050 | A902879 |
| Indeno(1,2,3-cd)pyrene | mg/L | - | <0.0000085 | 0.0000085 | A902879 |
| 1-Methylnaphthalene | mg/L | - | <0.00010 | 0.00010 | A902879 |
| 2-Methylnaphthalene | mg/L | - | <0.00010 | 0.00010 | A902879 |
| Naphthalene | mg/L | 0.47 | <0.00010 | 0.00010 | A902879 |
| Phenanthrene | mg/L | - | <0.000050 | 0.000050 | A902879 |
| Perylene | mg/L | - | <0.000050 | 0.000050 | A902879 |
| Pyrene | mg/L | 0.71 | <0.000020 | 0.000020 | A902879 |
| Quinoline | mg/L | - | <0.00020 | 0.00020 | A902879 |
| **Surrogate Recovery (%)** | | | | | |
| D10-ANTHRACENE (sur.) | % | - | 109 | N/A | A902879 |
| D8-ACENAPHTHYLENE (sur.) | % | - | 110 | N/A | A902879 |
| D8-NAPHTHALENE (sur.) | % | - | 98 | N/A | A902879 |
| TERPHENYL-D14 (sur.) | % | - | 112 | N/A | A902879 |

| | |
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STANTEC CONSULTING LTD
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## MERCURY BY COLD VAPOR (WATER)

| **Bureau Veritas ID** | | | BNB967 | | |
|---|---|---|---|---|---|
| **Sampling Date** | | | 2023/03/08 08:00 | | |
| **COC Number** | | | TV - 1 | | |
| | **UNITS** | **Criteria** | **PSBLEND** | **RDL** | **QC Batch** |
| **Elements** | | | | | |
| Dissolved Mercury (Hg) | ug/L | 1 | <0.0019 | 0.0019 | A903833 |

| | |
|---|---|
| No Fill | No Exceedance |
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## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| Bureau Veritas ID | | | BNB967 | BNB967 | | |
|---|---|---|---|---|---|---|
| Sampling Date | | | 2023/03/08 08:00 | 2023/03/08 08:00 | | |
| COC Number | | | TV - 1 | TV - 1 | | |
| | UNITS | Criteria | PSBLEND | PSBLEND Lab-Dup | RDL | QC Batch |
| **Elements** | | | | | | |
| Dissolved Aluminum (Al) | mg/L | 0.2 | <0.0030 | N/A | 0.0030 | A903595 |
| Dissolved Antimony (Sb) | mg/L | 0.006 | <0.00060 | N/A | 0.00060 | A903595 |
| Dissolved Arsenic (As) | mg/L | 0.01 | <0.00020 | N/A | 0.00020 | A903595 |
| Dissolved Barium (Ba) | mg/L | 2 | 0.069 | 0.068 | 0.010 | A903610 |
| Dissolved Beryllium (Be) | mg/L | - | <0.0010 | N/A | 0.0010 | A903595 |
| Dissolved Bismuth (Bi) | mg/L | - | <0.0050 | <0.0050 | 0.0050 | A903598 |
| Dissolved Boron (B) | mg/L | 5 | <0.020 | <0.020 | 0.020 | A903610 |
| Dissolved Calcium (Ca) | mg/L | - | 67 | 67 | 0.30 | A903610 |
| Dissolved Chromium (Cr) | mg/L | 0.05 | <0.0010 | N/A | 0.0010 | A903595 |
| Dissolved Cobalt (Co) | mg/L | - | <0.00030 | N/A | 0.00030 | A903595 |
| Dissolved Copper (Cu) | mg/L | 2 | 0.0015 | N/A | 0.0010 | A903595 |
| Dissolved Iron (Fe) | mg/L | 0.3 | <0.060 | <0.060 | 0.060 | A903610 |
| Dissolved Lead (Pb) | mg/L | 0.005 | <0.00020 | N/A | 0.00020 | A903595 |
| Dissolved Lithium (Li) | mg/L | - | <0.020 | <0.020 | 0.020 | A903610 |
| Dissolved Magnesium (Mg) | mg/L | - | 18 | 18 | 0.20 | A903610 |
| Dissolved Manganese (Mn) | mg/L | 0.12 | <0.0040 | <0.0040 | 0.0040 | A903610 |
| Dissolved Molybdenum (Mo | mg/L | - | 0.00089 | N/A | 0.00020 | A903595 |
| Dissolved Nickel (Ni) | mg/L | - | 0.00053 | N/A | 0.00050 | A903595 |
| Dissolved Phosphorus (P) | mg/L | - | <0.10 | <0.10 | 0.10 | A903610 |
| Dissolved Potassium (K) | mg/L | - | 0.71 | 0.72 | 0.30 | A903610 |
| Dissolved Selenium (Se) | mg/L | 0.05 | 0.0014 | N/A | 0.00020 | A903595 |
| Dissolved Silicon (Si) | mg/L | - | 1.8 | 1.8 | 0.50 | A903610 |
| Dissolved Silver (Ag) | mg/L | - | <0.00010 | N/A | 0.00010 | A903595 |
| Dissolved Sodium (Na) | mg/L | 200 | 5.5 | 5.6 | 0.50 | A903610 |
| Dissolved Strontium (Sr) | mg/L | 7 | 0.31 | 0.31 | 0.020 | A903610 |
| Dissolved Sulphur (S) | mg/L | - | 27 | 27 | 0.20 | A903610 |
| Dissolved Thallium (Tl) | mg/L | - | <0.00020 | N/A | 0.00020 | A903595 |
| Dissolved Tin (Sn) | mg/L | - | <0.0010 | N/A | 0.0010 | A903595 |
| Dissolved Titanium (Ti) | mg/L | - | <0.0010 | N/A | 0.0010 | A903595 |
| Dissolved Uranium (U) | mg/L | 0.02 | 0.00073 | N/A | 0.00010 | A903595 |

| | |
|---|---|
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Bureau Veritas Job #: C316001
Report Date: 2023/03/15

STANTEC CONSULTING LTD
Client Project #: 123512493
Site Location: TURNER VALLEY

## ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

| **Bureau Veritas ID** | | | BNB967 | BNB967 | | |
|---|---|---|---|---|---|---|
| **Sampling Date** | | | 2023/03/08 08:00 | 2023/03/08 08:00 | | |
| **COC Number** | | | TV - 1 | TV - 1 | | |
| | **UNITS** | **Criteria** | **PSBLEND** | **PSBLEND Lab-Dup** | **RDL** | **QC Batch** |
| Dissolved Vanadium (V) | mg/L | - | <0.0010 | N/A | 0.0010 | A903595 |
| Dissolved Zinc (Zn) | mg/L | 5 | 0.0046 | N/A | 0.0030 | A903595 |

| | |
|---|---|
| No Fill | No Exceedance |
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## VOLATILE ORGANICS BY GC-MS (WATER)

| **Bureau Veritas ID** | | | BNB967 | | |
|---|---|---|---|---|---|
| **Sampling Date** | | | 2023/03/08 08:00 | | |
| **COC Number** | | | TV - 1 | | |
| | **UNITS** | **Criteria** | **PSBLEND** | **RDL** | **QC Batch** |
| **Volatiles** | | | | | |
| Benzene | mg/L | 0.005 | <0.00040 | 0.00040 | A905341 |
| Toluene | mg/L | 0.024 | <0.00040 | 0.00040 | A905341 |
| Ethylbenzene | mg/L | 0.0016 | <0.00040 | 0.00040 | A905341 |
| m & p-Xylene | mg/L | - | <0.00080 | 0.00080 | A905341 |
| o-Xylene | mg/L | - | <0.00040 | 0.00040 | A905341 |
| Xylenes (Total) | mg/L | 0.3 | <0.00089 | 0.00089 | A901965 |
| F1 (C6-C10) - BTEX | mg/L | 2.2 | <0.10 | 0.10 | A901965 |
| F1 (C6-C10) | mg/L | - | <0.10 | 0.10 | A905341 |
| **Surrogate Recovery (%)** | | | | | |
| 1,4-Difluorobenzene (sur.) | % | - | 99 | N/A | A905341 |
| 4-Bromofluorobenzene (sur. | % | - | 102 | N/A | A905341 |
| D4-1,2-Dichloroethane (sur.) | % | - | 89 | N/A | A905341 |

| | |
|---|---|
| No Fill | No Exceedance |
| Grey | Exceeds 1 criteria policy/level |
| Black | Exceeds both criteria/levels |

RDL = Reportable Detection Limit
N/A = Not Applicable



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## GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

| | |
|---|---|
| Package 1 | 1.0°C |

Criteria: Turner Valley
Storedwater.
Measurement of Uncertainty has not been accounted for when stating conformity to the selected criteria, where applicable.

**Results relate only to the items tested.**



Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C316001
Report Date: 2023/03/15

# QUALITY ASSURANCE REPORT

STANTEC CONSULTING LTD
Client Project #: 123512493
Site Location: TURNER VALLEY

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| A902597 | O-TERPHENYL (sur.) | 2023/03/09 | | | 87 | 60 - 140 | 90 | % | | | | |
| A902879 | D10-ANTHRACENE (sur.) | 2023/03/09 | 104 | 50 - 130 | 105 | 50 - 130 | 101 | % | | | | |
| A902879 | D8-ACENAPHTHYLENE (sur.) | 2023/03/09 | 106 | 50 - 130 | 96 | 50 - 130 | 98 | % | | | | |
| A902879 | D8-NAPHTHALENE (sur.) | 2023/03/09 | 94 | 50 - 130 | 83 | 50 - 130 | 80 | % | | | | |
| A902879 | TERPHENYL-D14 (sur.) | 2023/03/09 | 104 | 50 - 130 | 93 | 50 - 130 | 102 | % | | | | |
| A905341 | 1,4-Difluorobenzene (sur.) | 2023/03/12 | 95 | 50 - 140 | 95 | 50 - 140 | 98 | % | | | | |
| A905341 | 4-Bromofluorobenzene (sur.) | 2023/03/12 | 102 | 50 - 140 | 100 | 50 - 140 | 98 | % | | | | |
| A905341 | D4-1,2-Dichloroethane (sur.) | 2023/03/12 | 87 | 50 - 140 | 85 | 50 - 140 | 87 | % | | | | |
| A902597 | F2 (C10-C16 Hydrocarbons) | 2023/03/09 | | | 95 | 60 - 140 | <0.10 | mg/L | | | | |
| A902879 | 1-Methylnaphthalene | 2023/03/09 | 70 | 50 - 130 | 57 | 50 - 130 | <0.00010 | mg/L | 0.43 | 30 | | |
| A902879 | 2-Methylnaphthalene | 2023/03/09 | 90 | 50 - 130 | 73 | 50 - 130 | <0.00010 | mg/L | 1.3 | 30 | | |
| A902879 | Acenaphthene | 2023/03/09 | 93 | 50 - 130 | 79 | 50 - 130 | <0.00010 | mg/L | NC | 30 | | |
| A902879 | Acenaphthylene | 2023/03/09 | 94 | 50 - 130 | 82 | 50 - 130 | <0.00010 | mg/L | NC | 30 | | |
| A902879 | Acridine | 2023/03/09 | 95 | 50 - 130 | 93 | 50 - 130 | <0.000040 | mg/L | NC | 30 | | |
| A902879 | Anthracene | 2023/03/09 | 101 | 50 - 130 | 98 | 50 - 130 | <0.000010 | mg/L | NC | 30 | | |
| A902879 | Benzo(a)anthracene | 2023/03/09 | 111 | 50 - 130 | 100 | 50 - 130 | <0.0000085 | mg/L | NC | 30 | | |
| A902879 | Benzo(a)pyrene | 2023/03/09 | 106 | 50 - 130 | 94 | 50 - 130 | <0.0000075 | mg/L | NC | 30 | | |
| A902879 | Benzo(b&j)fluoranthene | 2023/03/09 | 101 | 50 - 130 | 91 | 50 - 130 | <0.0000085 | mg/L | NC | 30 | | |
| A902879 | Benzo(c)phenanthrene | 2023/03/09 | 112 | 50 - 130 | 99 | 50 - 130 | <0.000050 | mg/L | NC | 30 | | |
| A902879 | Benzo(e)pyrene | 2023/03/09 | 98 | 50 - 130 | 87 | 50 - 130 | <0.000050 | mg/L | NC | 30 | | |
| A902879 | Benzo(g,h,i)perylene | 2023/03/09 | 86 | 50 - 130 | 77 | 50 - 130 | <0.0000085 | mg/L | NC | 30 | | |
| A902879 | Benzo(k)fluoranthene | 2023/03/09 | 104 | 50 - 130 | 92 | 50 - 130 | <0.0000085 | mg/L | NC | 30 | | |
| A902879 | Chrysene | 2023/03/09 | 105 | 50 - 130 | 94 | 50 - 130 | <0.0000085 | mg/L | NC | 30 | | |
| A902879 | Dibenz(a,h)anthracene | 2023/03/09 | 92 | 50 - 130 | 80 | 50 - 130 | <0.0000075 | mg/L | NC | 30 | | |
| A902879 | Fluoranthene | 2023/03/09 | 92 | 50 - 130 | 90 | 50 - 130 | <0.000010 | mg/L | NC | 30 | | |
| A902879 | Fluorene | 2023/03/09 | 100 | 50 - 130 | 87 | 50 - 130 | <0.000050 | mg/L | NC | 30 | | |
| A902879 | Indeno(1,2,3-cd)pyrene | 2023/03/09 | 96 | 50 - 130 | 84 | 50 - 130 | <0.0000085 | mg/L | NC | 30 | | |
| A902879 | Naphthalene | 2023/03/09 | 81 | 50 - 130 | 73 | 50 - 130 | <0.00010 | mg/L | 4.0 | 30 | | |
| A902879 | Perylene | 2023/03/09 | 96 | 50 - 130 | 86 | 50 - 130 | <0.000050 | mg/L | NC | 30 | | |
| A902879 | Phenanthrene | 2023/03/09 | 100 | 50 - 130 | 97 | 50 - 130 | <0.000050 | mg/L | NC | 30 | | |
| A902879 | Pyrene | 2023/03/09 | 92 | 50 - 130 | 90 | 50 - 130 | <0.000020 | mg/L | NC | 30 | | |
| A902879 | Quinoline | 2023/03/09 | 96 | 50 - 130 | 93 | 50 - 130 | <0.00020 | mg/L | NC | 30 | | |



Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C316001
Report Date: 2023/03/15

# QUALITY ASSURANCE REPORT(CONT'D)

STANTEC CONSULTING LTD
Client Project #: 123512493
Site Location: TURNER VALLEY

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| A903515 | Strong Acid Dissoc. Cyanide (CN) | 2023/03/09 | 74 (1) | 80 - 120 | 106 | 80 - 120 | <0.00050 | mg/L | 2.2 | 20 | | |
| A903595 | Dissolved Aluminum (Al) | 2023/03/09 | 98 | 80 - 120 | 104 | 80 - 120 | <0.0030 | mg/L | NC | 20 | | |
| A903595 | Dissolved Antimony (Sb) | 2023/03/09 | 102 | 80 - 120 | 105 | 80 - 120 | <0.00060 | mg/L | NC | 20 | | |
| A903595 | Dissolved Arsenic (As) | 2023/03/09 | 95 | 80 - 120 | 97 | 80 - 120 | <0.00020 | mg/L | 5.3 | 20 | | |
| A903595 | Dissolved Beryllium (Be) | 2023/03/09 | 93 | 80 - 120 | 95 | 80 - 120 | <0.0010 | mg/L | NC | 20 | | |
| A903595 | Dissolved Chromium (Cr) | 2023/03/09 | 91 | 80 - 120 | 97 | 80 - 120 | <0.0010 | mg/L | NC | 20 | | |
| A903595 | Dissolved Cobalt (Co) | 2023/03/09 | 94 | 80 - 120 | 100 | 80 - 120 | <0.00030 | mg/L | 0.43 | 20 | | |
| A903595 | Dissolved Copper (Cu) | 2023/03/09 | 94 | 80 - 120 | 100 | 80 - 120 | <0.0010 | mg/L | 0.60 | 20 | | |
| A903595 | Dissolved Lead (Pb) | 2023/03/09 | 99 | 80 - 120 | 103 | 80 - 120 | <0.00020 | mg/L | NC | 20 | | |
| A903595 | Dissolved Molybdenum (Mo) | 2023/03/09 | 101 | 80 - 120 | 106 | 80 - 120 | <0.00020 | mg/L | 7.2 | 20 | | |
| A903595 | Dissolved Nickel (Ni) | 2023/03/09 | 92 | 80 - 120 | 97 | 80 - 120 | <0.00050 | mg/L | 9.7 | 20 | | |
| A903595 | Dissolved Selenium (Se) | 2023/03/09 | 93 | 80 - 120 | 97 | 80 - 120 | <0.00020 | mg/L | NC | 20 | | |
| A903595 | Dissolved Silver (Ag) | 2023/03/09 | 97 | 80 - 120 | 102 | 80 - 120 | <0.00010 | mg/L | NC | 20 | | |
| A903595 | Dissolved Thallium (Tl) | 2023/03/09 | 99 | 80 - 120 | 102 | 80 - 120 | <0.00020 | mg/L | NC | 20 | | |
| A903595 | Dissolved Tin (Sn) | 2023/03/09 | 100 | 80 - 120 | 106 | 80 - 120 | <0.0010 | mg/L | NC | 20 | | |
| A903595 | Dissolved Titanium (Ti) | 2023/03/09 | 95 | 80 - 120 | 93 | 80 - 120 | <0.0010 | mg/L | NC | 20 | | |
| A903595 | Dissolved Uranium (U) | 2023/03/09 | 98 | 80 - 120 | 103 | 80 - 120 | <0.00010 | mg/L | 9.5 | 20 | | |
| A903595 | Dissolved Vanadium (V) | 2023/03/09 | 93 | 80 - 120 | 97 | 80 - 120 | <0.0010 | mg/L | NC | 20 | | |
| A903595 | Dissolved Zinc (Zn) | 2023/03/09 | 91 | 80 - 120 | 97 | 80 - 120 | <0.0030 | mg/L | 16 | 20 | | |
| A903598 | Dissolved Bismuth (Bi) | 2023/03/09 | 96 | 80 - 120 | 98 | 80 - 120 | <0.0050 | mg/L | NC | 20 | | |
| A903610 | Dissolved Barium (Ba) | 2023/03/09 | 102 | 80 - 120 | 102 | 80 - 120 | <0.010 | mg/L | 1.0 | 20 | | |
| A903610 | Dissolved Boron (B) | 2023/03/09 | 103 | 80 - 120 | 100 | 80 - 120 | <0.020 | mg/L | NC | 20 | | |
| A903610 | Dissolved Calcium (Ca) | 2023/03/09 | 97 | 80 - 120 | 100 | 80 - 120 | <0.30 | mg/L | 0.53 | 20 | | |
| A903610 | Dissolved Iron (Fe) | 2023/03/09 | 102 | 80 - 120 | 104 | 80 - 120 | <0.060 | mg/L | NC | 20 | | |
| A903610 | Dissolved Lithium (Li) | 2023/03/09 | 102 | 80 - 120 | 102 | 80 - 120 | <0.020 | mg/L | NC | 20 | | |
| A903610 | Dissolved Magnesium (Mg) | 2023/03/09 | 100 | 80 - 120 | 102 | 80 - 120 | <0.20 | mg/L | 0.40 | 20 | | |
| A903610 | Dissolved Manganese (Mn) | 2023/03/09 | 104 | 80 - 120 | 104 | 80 - 120 | <0.0040 | mg/L | NC | 20 | | |
| A903610 | Dissolved Phosphorus (P) | 2023/03/09 | 101 | 80 - 120 | 100 | 80 - 120 | <0.10 | mg/L | NC | 20 | | |
| A903610 | Dissolved Potassium (K) | 2023/03/09 | 102 | 80 - 120 | 101 | 80 - 120 | <0.30 | mg/L | 0.94 | 20 | | |
| A903610 | Dissolved Silicon (Si) | 2023/03/09 | 97 | 80 - 120 | 100 | 80 - 120 | <0.50 | mg/L | 1.6 | 20 | | |
| A903610 | Dissolved Sodium (Na) | 2023/03/09 | 101 | 80 - 120 | 102 | 80 - 120 | <0.50 | mg/L | 0.18 | 20 | | |
| A903610 | Dissolved Strontium (Sr) | 2023/03/09 | 96 | 80 - 120 | 98 | 80 - 120 | <0.020 | mg/L | 0.55 | 20 | | |



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Bureau Veritas Job #: C316001
Report Date: 2023/03/15

# QUALITY ASSURANCE REPORT(CONT'D)

STANTEC CONSULTING LTD
Client Project #: 123512493
Site Location: TURNER VALLEY

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| A903610 | Dissolved Sulphur (S) | 2023/03/09 | 100 | 80 - 120 | 98 | 80 - 120 | <0.20 | mg/L | 0.68 | 20 | | |
| A903795 | True Colour | 2023/03/09 | 96 | 80 - 120 | 102 | 80 - 120 | <2.0 | PtCo units | 20 | 20 | | |
| A903814 | Turbidity | 2023/03/09 | | | 99 | 80 - 120 | <0.10 | NTU | 0.80 | 20 | | |
| A903833 | Dissolved Mercury (Hg) | 2023/03/10 | 107 | 80 - 120 | 101 | 80 - 120 | <0.0019 | ug/L | NC | 20 | | |
| A903928 | Chloride (Cl) | 2023/03/09 | NC | 80 - 120 | 101 | 80 - 120 | <1.0 | mg/L | 1.0 | 20 | | |
| A903928 | Sulphate (SO4) | 2023/03/09 | NC | 80 - 120 | 107 | 80 - 120 | <1.0 | mg/L | 2.5 | 20 | | |
| A904077 | Nitrate plus Nitrite (N) | 2023/03/09 | 32 (1) | 80 - 120 | 103 | 80 - 120 | <0.010 | mg/L | NC | 20 | | |
| A904077 | Nitrite (N) | 2023/03/09 | 93 | 80 - 120 | 99 | 80 - 120 | <0.010 | mg/L | NC | 20 | | |
| A904438 | Alkalinity (PP as CaCO3) | 2023/03/09 | | | | | <1.0 | mg/L | NC | 20 | | |
| A904438 | Alkalinity (Total as CaCO3) | 2023/03/09 | | | 99 | 80 - 120 | <1.0 | mg/L | 0.025 | 20 | | |
| A904438 | Bicarbonate (HCO3) | 2023/03/09 | | | | | <1.0 | mg/L | 0.025 | 20 | | |
| A904438 | Carbonate (CO3) | 2023/03/09 | | | | | <1.0 | mg/L | NC | 20 | | |
| A904438 | Hydroxide (OH) | 2023/03/09 | | | | | <1.0 | mg/L | NC | 20 | | |
| A904441 | pH | 2023/03/09 | | | 100 | 97 - 103 | | | 0.073 | N/A | | |
| A904443 | Conductivity | 2023/03/09 | | | 100 | 90 - 110 | <2.0 | uS/cm | 0 | 10 | | |
| A904445 | Dissolved Fluoride (F) | 2023/03/09 | 103 | 80 - 120 | 95 | 80 - 120 | <0.050 | mg/L | 0.48 | 20 | | |
| A905341 | Benzene | 2023/03/12 | 75 | 50 - 140 | 75 | 60 - 130 | <0.00040 | mg/L | NC | 30 | | |
| A905341 | Ethylbenzene | 2023/03/12 | 82 | 50 - 140 | 83 | 60 - 130 | <0.00040 | mg/L | NC | 30 | | |
| A905341 | F1 (C6-C10) | 2023/03/12 | 110 | 60 - 140 | 109 | 60 - 140 | <0.10 | mg/L | NC | 30 | | |
| A905341 | m & p-Xylene | 2023/03/12 | 81 | 50 - 140 | 82 | 60 - 130 | <0.00080 | mg/L | NC | 30 | | |
| A905341 | o-Xylene | 2023/03/12 | 80 | 50 - 140 | 80 | 60 - 130 | <0.00040 | mg/L | NC | 30 | | |
| A905341 | Toluene | 2023/03/12 | 76 | 50 - 140 | 76 | 60 - 130 | <0.00040 | mg/L | NC | 30 | | |
| A905354 | Total Nitrogen (N) | 2023/03/10 | 95 | 80 - 120 | 95 | 80 - 120 | <0.020 | mg/L | 8.0 | 20 | 96 | 80 - 120 |



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Bureau Veritas Job #: C316001
Report Date: 2023/03/15

# QUALITY ASSURANCE REPORT(CONT'D)

STANTEC CONSULTING LTD
Client Project #: 123512493
Site Location: TURNER VALLEY

| | | | Matrix Spike | | Spiked Blank | | Method Blank | | RPD | | QC Standard | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QC Batch | Parameter | Date | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits | % Recovery | QC Limits |
| A907047 | Total Organic Carbon (C) | 2023/03/13 | 74 (1) | 80 - 120 | 99 | 80 - 120 | <0.50 | mg/L | 1.8 | 20 | | |

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

## VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Janet Gao, B.Sc., QP, Supervisor, Organics

Jared Wiseman, B.Sc., P.Chem., QP, Senior Analyst, Organics

Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

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Logiciel Propriétaire de Bureau Veritas

Automated Statchk

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Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

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Maxxam Analytics Inc

Maxxam Analytics International Corporation o/a Maxxam Analytics
4000 19th Street NE, Calgary, Alberta Canada T2E 6P8 Tel: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247

# CHAIN OF CUSTODY RECORD

Page ___ of ___

**INVOICE INFORMATION:**

Company Name: SRRUC c/o Jill Hardy (jhardy@mpe.ca)
Contact Name: Christine Hummel
Address: BOX 5605
HIGH RIVER, AB T1V 1M7
Phone: (403) 603-6233 Fax: (403) 652-7880
Email: christine.hummel@mdfoothills.com

**REPORT INFORMATION (if differs from invoice):**

Company Name: Stantec Consulting Ltd.
Contact Name: Lincoln Weller
Address: 200, 325 25 ST NE
Calgary, AB T2A 7H8
Phone: (403) 451-4416 Fax: (403) 716-8039
Email: lincoln.weller@stantec.com

**PROJECT INFORMATION:**

Quotation #:
P.O. #:
Project #: 123512493
Project Name: Turner Valley Reservoir Project
Site Location: Turner Valley
Sampled By:

**Laboratory Use Only**

MAXXAM JOB #: C31 6001
BOTTLE ORDER #:
CHAIN OF CUSTODY #: TV-1
PROJECT MANAGER: Geraldlyn Coutlee

REGULATORY CRITERIA:
AB TIER 1
AB Surface Water Quality Guidelines

SPECIAL INSTRUCTIONS:

**Report Distribution**
lincoln.weller@stantec.com, david.alberti@stantec.com
jhardy@mpe.ca, mdurand@mpe.ca
dennis.leis@Foothillscountyab, dennisleis@gmail.com
Mike.papuc@Foothillscountyab.
HarryRiva.Cambrin@mdfoothills.com
kelly.frey@foothillscountyab.ca

SAMPLES MUST BE KEPT COOL ( < 10 °C ) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED

| | Sample Barcode Label | Sample (Location) Identification | Date Sampled &Time Sampled | Matrix | Metals Field Filtered ? ( Y / N ) | GW - Groundwater Reg TAT | IN - Interceptor Water Reg TAT | Stored Water Reg TAT | Town Wells Reg TAT | # of Bottles | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | N/A | PSBlend | 08/03/2023 @ 8:00Hrs | W | Y | | | X | | 8 | |
| 2 | N/A | | | | | | | | | | |
| 3 | N/A | | | | | | | | | | |
| 4 | N/A | | | | | | | | | | |
| 5 | N/A | | | | | | | | | | |
| 6 | N/A | | | | | | | | | | |
| 7 | N/A | | | | | | | | | | |
| 8 | N/A | | | | | | | | | | |
| 9 | N/A | | | | | | | | | | |
| 10 | N/A | | | | | | | | | | |

TURNAROUND TIME (TAT) REQUIRED

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☐
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests
Please note: Standard TAT for certain tests such as > 5 days - contact your Project Manager for details

Job Specific Rush TAT (if applies to entire submission)
Date Required:
Rush Confirmation Number: (call lab for #)

| RELINQUISHED BY: (Signature/Print) | Date: (YY/MM/DD) | Time: | RECEIVED BY: (Signature/Print) | Date: (YY/MM/DD) | Time: | # of Jars Used & not submitted | Temperature (°C) on Receipt | Custody Seals Intact |
|---|---|---|---|---|---|---|---|---|
| Kelly Frey | 2023/03/08 | | Joshua Lungay | 2023/03/08 | 10:53 | | 1, 1, 1 | ☐ Ok ☐ Sealed ☐ Not Present |

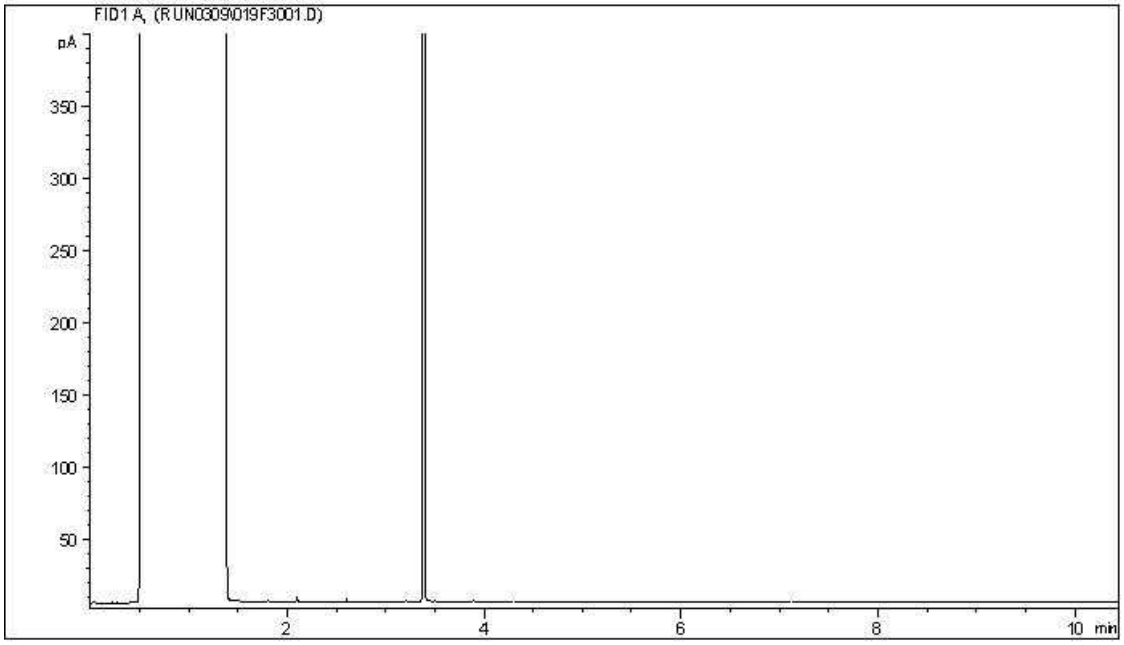
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD, AN INCOMPLETE CHAIN OF CUSTODY MAY RESULTS IN ANALYICAL TAT DELAYS
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUEST PLEASE CONTACT YOUR PROJECT MANAGER

Bureau Veritas Job #: C316001
Report Date: 2023/03/15
Bureau Veritas Sample: BNB967

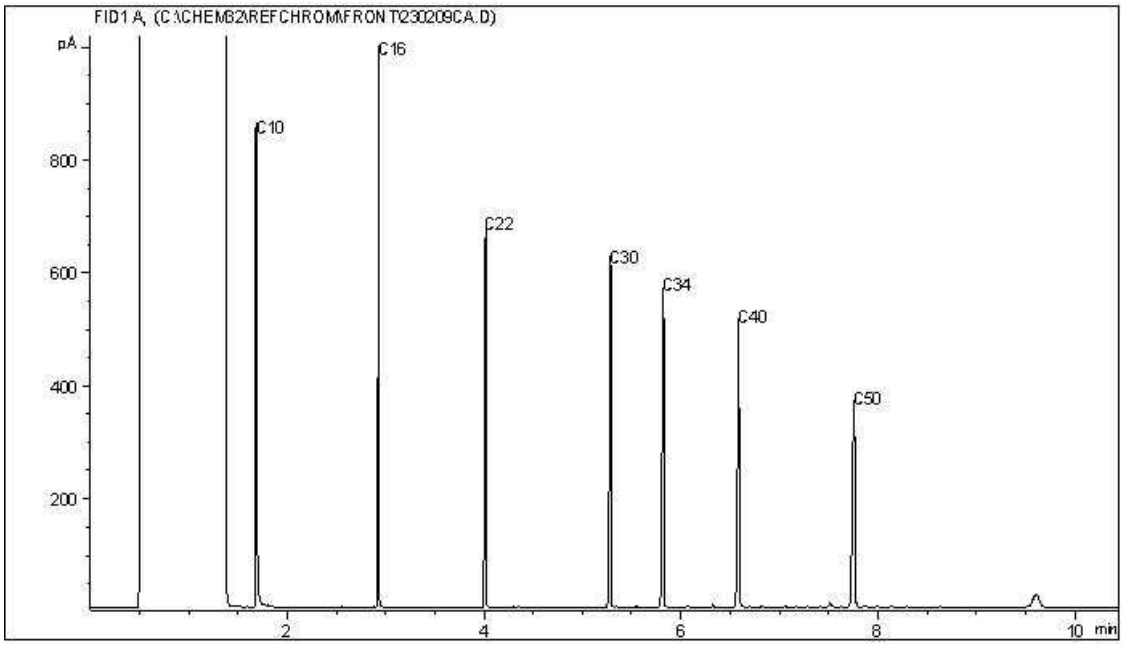
STANTEC CONSULTING LTD
Client Project #: 123512493
Site Reference: TURNER VALLEY
Client ID: PSBLEND

**CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram**

Instrument: GC6




Carbon Range Distribution - Reference Chromatogram




TYPICAL PRODUCT CARBON NUMBER RANGES

| | | | |
|---|---|---|---|
| Gasoline: | C4 - C12 | Diesel: | C8 - C22 |
| Varsol: | C8 - C12 | Lubricating Oils: | C20 - C40 |
| Kerosene: | C7 - C16 | Crude Oils: | C3 - C60+ |

**Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.**