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# CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

| | | | |
|---|---|---|---|
| **Work Order** | : **WP2421707** | Page | : 1 of 6 |
| Client | : **Manitoba Conservation & Climate** | Laboratory | : ALS Environmental - Winnipeg |
| Contact | : Amanda Fewings | Account Manager | : Sheriza Rajack-Ahamed |
| Address | : 14 Fultz Boulevard<br>Winnipeg MB Canada R3Y 0L6 | Address | : 1329 Niakwa Road East, Unit 12<br>Winnipeg, Manitoba Canada R2J 3T4 |
| Telephone | : 204 945 5776 | Telephone | : +1 204 255 9720 |
| Project | : CARTIER REGIONAL - PWS 36.00 | Date Samples Received | : 10-Sep-2024 15:27 |
| PO | : ---- | Date Analysis Commenced | : 11-Sep-2024 |
| C-O-C number | : ---- | Issue Date | : 07-Oct-2024 13:41 |
| Sampler | : Grant McGorman | | |
| Site | : Cartier Regional - PWS 36.00 Op ID: 28128 | | |
| Quote number | : 2024 WTP Chemistry | | |
| No. of samples received | : 3 | | |
| No. of samples analysed | : 3 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).**

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Christopher Chow | | Inorganics, Winnipeg, Manitoba |
| Oleksandr Busel | | Inorganics, Winnipeg, Manitoba |
| Oleksandr Busel | | Metals, Winnipeg, Manitoba |

## No Breaches Found

## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.
Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

| *Unit* | *Description* |
|---|---|
| - | no units |
| % | percent |
| % T/cm | % transmittance per centimetre |
| µg/L | micrograms per litre |
| µS/cm | microsiemens per centimetre |
| AU/cm | absorbance units per centimetre |
| CU | colour units (1 cu = 1 mg/l pt) |
| meq/L | milliequivalents per litre |
| mg/L | milligrams per litre |
| NTU | nephelometric turbidity units |
| pH units | pH units |

>: greater than.
<: less than.
Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.

## Qualifiers

| Qualifier | Description |
|---|---|
| DLM | Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity). |

## Analytical Results Evaluation

Matrix: **Water**

| Analyte | CAS Number | Method/Lab | Unit | Client sample ID | Cartier Regional 1 - Raw | Cartier Regional 2 - Treated | Cartier Regional 3 - Distribution Fanngstelle In | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date/time | 10-Sep-2024 08:15 | 10-Sep-2024 08:30 | 10-Sep-2024 07:00 | ---- | ---- | ---- | ---- |
| | | | | Sub-Matrix | Water | Water | Water | ---- | ---- | ---- | ---- |
| | | | | | WP2421707-001 | WP2421707-002 | WP2421707-003 | -------- | -------- | -------- | -------- |
| **Physical Tests** | | | | | | | | | | | |
| **Absorbance, UV (@ 254nm)** | ---- | E404/WP | AU/cm | | 0.290 | 0.0340 | ---- | ---- | ---- | ---- | ---- |
| **Alkalinity, bicarbonate (as CaCO3)** | ---- | E290/WP | mg/L | | 236 | 72.1 | ---- | ---- | ---- | ---- | ---- |
| **Alkalinity, carbonate (as CaCO3)** | ---- | E290/WP | mg/L | | 21.2 | <1.0 | ---- | ---- | ---- | ---- | ---- |
| **Alkalinity, hydroxide (as CaCO3)** | ---- | E290/WP | mg/L | | <1.0 | <1.0 | ---- | ---- | ---- | ---- | ---- |
| **Alkalinity, total (as CaCO3)** | ---- | E290/WP | mg/L | | 257 | 72.1 | ---- | ---- | ---- | ---- | ---- |
| **Colour, true** | ---- | E329/WP | CU | | 19.6 | <5.0 | ---- | ---- | ---- | ---- | ---- |
| **Conductivity** | ---- | E100/WP | µS/cm | | 856 | 241 | ---- | ---- | ---- | ---- | ---- |
| **Hardness (as CaCO3), from total Ca/Mg** | ---- | EC100A/WP | mg/L | | 355 | 49.9 | ---- | ---- | ---- | ---- | ---- |
| **Langelier index (@ 4°C)** | ---- | EC105A/WP | - | | 1.07 | -0.861 | ---- | ---- | ---- | ---- | ---- |
| **Langelier index (@ 60°C)** | ---- | EC105A/WP | - | | 1.81 | -0.090 | ---- | ---- | ---- | ---- | ---- |
| **pH** | ---- | E108/WP | pH units | | 8.55 | 7.88 | ---- | ---- | ---- | ---- | ---- |
| **Solids, total dissolved [TDS]** | ---- | E162-L/WP | mg/L | | 590 | 136 | ---- | ---- | ---- | ---- | ---- |
| **Turbidity** | ---- | E121/WP | NTU | | 4.62 | <0.10 | ---- | ---- | ---- | ---- | ---- |
| **Transmittance, UV (@ 254nm)** | ---- | E404/WP | % T/cm | | 51.3 | 92.5 | ---- | ---- | ---- | ---- | ---- |
| **Anions and Nutrients** | | | | | | | | | | | |
| **Ammonia, total (as N)** | 7664-41-7 | E298/WP | mg/L | | 0.0510 | <0.0050 | ---- | ---- | ---- | ---- | ---- |
| **Bromide** | 24959-67-9 | E235.Br-L/WP | mg/L | | <0.100 DLM | <0.050 | ---- | ---- | ---- | ---- | ---- |
| **Chloride** | 16887-00-6 | E235.Cl-L/WP | mg/L | | 20.8 | 9.14 | ---- | ---- | ---- | ---- | ---- |
| **Fluoride** | 16984-48-8 | E235.F/WP | mg/L | | 0.154 | 0.323 | ---- | ---- | ---- | ---- | ---- |
| **Nitrate (as N)** | 14797-55-8 | E235.NO3-L/WP | mg/L | | 0.194 | 0.126 | ---- | ---- | ---- | ---- | ---- |
| **Nitrite (as N)** | 14797-65-0 | E235.NO2-L/WP | mg/L | | 0.0026 | <0.0010 | ---- | ---- | ---- | ---- | ---- |
| **Sulfate (as SO4)** | 14808-79-8 | E235.SO4/WP | mg/L | | 191 | 31.8 | ---- | ---- | ---- | ---- | ---- |
| **Organic / Inorganic Carbon** | | | | | | | | | | | |
| **Carbon, dissolved organic [DOC]** | ---- | E358-L/WP | mg/L | | 9.43 | 1.49 | ---- | ---- | ---- | ---- | ---- |
| **Carbon, total organic [TOC]** | ---- | E355-L/WP | mg/L | | 11.1 | 1.40 | ---- | ---- | ---- | ---- | ---- |
| **Ion Balance** | | | | | | | | | | | |

## Analytical Results Evaluation

Matrix: **Water**

| Analyte | CAS Number | Method/Lab | Unit | Client sample ID | Cartier Regional 1 - Raw | Cartier Regional 2 - Treated | Cartier Regional 3 - Distribution Fanngstelle In | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date/time | 10-Sep-2024 08:15 | 10-Sep-2024 08:30 | 10-Sep-2024 07:00 | ---- | ---- | ---- | ---- |
| | | | | Sub-Matrix | Water | Water | Water | ---- | ---- | ---- | ---- |
| | | | | WP2421707-001 | WP2421707-002 | WP2421707-003 | -------- | -------- | -------- | -------- | |
| **Ion Balance** | | | | | | | | | | | |
| **Anion sum** | ---- | EC101A/WP | meq/L | 9.72 | 2.39 | ---- | ---- | ---- | ---- | ---- | |
| **Cation sum (total)** | ---- | EC101A/WP | meq/L | 9.62 | 2.22 | ---- | ---- | ---- | ---- | ---- | |
| **Ion balance (cations/anions)** | ---- | EC101A/WP | % | 99.0 | 92.9 | ---- | ---- | ---- | ---- | ---- | |
| **Ion balance (APHA)** | ---- | EC101A/WP | % | -0.517 | -3.69 | ---- | ---- | ---- | ---- | ---- | |
| **Total Metals** | | | | | | | | | | | |
| **Aluminum, total** | 7429-90-5 | E420/WP | µg/L | 187 | 4.0 | 9.1 | ---- | ---- | ---- | ---- | |
| **Antimony, total** | 7440-36-0 | E420/WP | µg/L | 0.34 | <0.10 | <0.10 | ---- | ---- | ---- | ---- | |
| **Arsenic, total** | 7440-38-2 | E420/WP | µg/L | 7.87 | 1.04 | 1.05 | ---- | ---- | ---- | ---- | |
| **Barium, total** | 7440-39-3 | E420/WP | µg/L | 65.1 | 9.42 | 9.88 | ---- | ---- | ---- | ---- | |
| **Beryllium, total** | 7440-41-7 | E420/WP | µg/L | <0.020 | Not Detected | Not Detected | ---- | ---- | ---- | ---- | |
| **Bismuth, total** | 7440-69-9 | E420/WP | µg/L | <0.050 | <0.050 | <0.050 | ---- | ---- | ---- | ---- | |
| **Boron, total** | 7440-42-8 | E420/WP | µg/L | 103 | 85 | 85 | ---- | ---- | ---- | ---- | |
| **Cadmium, total** | 7440-43-9 | E420/WP | µg/L | 0.0089 | <0.0050 | <0.0050 | ---- | ---- | ---- | ---- | |
| **Calcium, total** | 7440-70-2 | E420/WP | µg/L | 72700 | 10400 | 10800 | ---- | ---- | ---- | ---- | |
| **Cesium, total** | 7440-46-2 | E420/WP | µg/L | 0.028 | <0.010 | <0.010 | ---- | ---- | ---- | ---- | |
| **Chromium, total** | 7440-47-3 | E420/WP | µg/L | <0.50 | <0.50 | <0.50 | ---- | ---- | ---- | ---- | |
| **Cobalt, total** | 7440-48-4 | E420/WP | µg/L | 0.21 | <0.10 | <0.10 | ---- | ---- | ---- | ---- | |
| **Copper, total** | 7440-50-8 | E420/WP | µg/L | 29.4 | 33.2 | 24.7 | ---- | ---- | ---- | ---- | |
| **Iron, total** | 7439-89-6 | E420/WP | µg/L | 171 | <10 | <10 | ---- | ---- | ---- | ---- | |
| **Lead, total** | 7439-92-1 | E420/WP | µg/L | 0.090 | <0.050 | 0.084 | ---- | ---- | ---- | ---- | |
| **Lithium, total** | 7439-93-2 | E420/WP | µg/L | 50.9 | 14.1 | 14.4 | ---- | ---- | ---- | ---- | |
| **Magnesium, total** | 7439-95-4 | E420/WP | µg/L | 42100 | 5820 | 5950 | ---- | ---- | ---- | ---- | |
| **Manganese, total** | 7439-96-5 | E420/WP | µg/L | 46.2 | 3.22 | 3.26 | ---- | ---- | ---- | ---- | |
| **Molybdenum, total** | 7439-98-7 | E420/WP | µg/L | 3.19 | 0.426 | 0.402 | ---- | ---- | ---- | ---- | |
| **Nickel, total** | 7440-02-0 | E420/WP | µg/L | 2.78 | 0.52 | <0.50 | ---- | ---- | ---- | ---- | |
| **Phosphorus, total** | 7723-14-0 | E420/WP | µg/L | 257 | 56 | 54 | ---- | ---- | ---- | ---- | |
| **Potassium, total** | 7440-09-7 | E420/WP | µg/L | 12100 | 3420 | 3450 | ---- | ---- | ---- | ---- | |

## Analytical Results Evaluation

Matrix: **Water**

| Analyte | CAS Number | Method/Lab | Unit | Client sample ID | Cartier Regional 1 - Raw | Cartier Regional 2 - Treated | Cartier Regional 3 - Distribution Fanngstelle In | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date/time | 10-Sep-2024 08:15 | 10-Sep-2024 08:30 | 10-Sep-2024 07:00 | ---- | ---- | ---- | ---- |
| | | | | Sub-Matrix | Water | Water | Water | ---- | ---- | ---- | ---- |
| | | | | WP2421707-001 | WP2421707-002 | WP2421707-003 | -------- | -------- | -------- | -------- | |
| **Total Metals** | | | | | | | | | | | |
| **Rubidium, total** | 7440-17-7 | E420/WP | µg/L | 2.93 | 0.78 | 0.89 | ---- | ---- | ---- | ---- | |
| **Selenium, total** | 7782-49-2 | E420/WP | µg/L | 0.517 | 0.088 | 0.095 | ---- | ---- | ---- | ---- | |
| **Silicon, total** | 7440-21-3 | E420/WP | µg/L | 10400 | 3410 | 3590 | ---- | ---- | ---- | ---- | |
| **Silver, total** | 7440-22-4 | E420/WP | µg/L | <0.010 | Not Detected | <0.010 | ---- | ---- | ---- | ---- | |
| **Sodium, total** | 7440-23-5 | E420/WP | µg/L | 50200 | 26100 | 26400 | ---- | ---- | ---- | ---- | |
| **Strontium, total** | 7440-24-6 | E420/WP | µg/L | 327 | 47.8 | 48.2 | ---- | ---- | ---- | ---- | |
| **Sulfur, total** | 7704-34-9 | E420/WP | µg/L | 67300 | 10500 | 10700 | ---- | ---- | ---- | ---- | |
| **Tellurium, total** | 13494-80-9 | E420/WP | µg/L | <0.20 | Not Detected | Not Detected | ---- | ---- | ---- | ---- | |
| **Thallium, total** | 7440-28-0 | E420/WP | µg/L | 0.014 | <0.010 | Not Detected | ---- | ---- | ---- | ---- | |
| **Thorium, total** | 7440-29-1 | E420/WP | µg/L | <0.10 | Not Detected | Not Detected | ---- | ---- | ---- | ---- | |
| **Tin, total** | 7440-31-5 | E420/WP | µg/L | <0.10 | <0.10 | 0.16 | ---- | ---- | ---- | ---- | |
| **Titanium, total** | 7440-32-6 | E420/WP | µg/L | 6.24 | <0.30 | <0.30 | ---- | ---- | ---- | ---- | |
| **Tungsten, total** | 7440-33-7 | E420/WP | µg/L | Not Detected | Not Detected | Not Detected | ---- | ---- | ---- | ---- | |
| **Uranium, total** | 7440-61-1 | E420/WP | µg/L | 2.90 | 0.348 | 0.367 | ---- | ---- | ---- | ---- | |
| **Vanadium, total** | 7440-62-2 | E420/WP | µg/L | 4.24 | 0.63 | 0.65 | ---- | ---- | ---- | ---- | |
| **Zinc, total** | 7440-66-6 | E420/WP | µg/L | <3.0 | 4.0 | 3.1 | ---- | ---- | ---- | ---- | |
| **Zirconium, total** | 7440-67-7 | E420/WP | µg/L | 0.32 | Not Detected | Not Detected | ---- | ---- | ---- | ---- | |

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

**Key:**

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# QUALITY CONTROL INTERPRETIVE REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **WP2421707** | Page | : 1 of 12 |
| Client | : **Manitoba Conservation & Climate** | Laboratory | : ALS Environmental - Winnipeg |
| Contact | : Amanda Fewings | Account Manager | : Sheriza Rajack-Ahamed |
| Address | : 14 Fultz Boulevard<br>Winnipeg MB Canada R3Y 0L6 | Address | : 1329 Niakwa Road East, Unit 12<br>Winnipeg, Manitoba Canada R2J 3T4 |
| Telephone | : 204 795 9614 | Telephone | : +1 204 255 9720 |
| Project | : CARTIER REGIONAL - PWS 36.00 | Date Samples Received | : 10-Sep-2024 15:27 |
| PO | : ---- | Issue Date | : 07-Oct-2024 13:43 |
| C-O-C number | : ---- | | |
| Sampler | : Grant McGorman | | |
| Site | : Cartier Regional - PWS 36.00 Op ID: 28128 | | |
| Quote number | : 2024 WTP Chemistry | | |
| No. of samples received | : 3 | | |
| No. of samples analysed | : 3 | | |

**This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.**

**Key**

**Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.**
**CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.**
**DQO: Data Quality Objective.**
**LOR: Limit of Reporting (detection limit).**
**RPD: Relative Percent Difference.**

## *Workorder Comments*

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

## *Summary of Outliers*

### *Outliers : Quality Control Samples*

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

### *Outliers: Reference Material (RM) Samples*

- No Reference Material (RM) Sample outliers occur.

## *Outliers : Analysis Holding Time Compliance (Breaches)*

- Analysis Holding Time Outliers exist - please see following pages for full details.

## *Outliers : Frequency of Quality Control Samples*

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

# Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group : Analytical Method / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **Anions and Nutrients : Ammonia by Fluorescence** | | | | | | | | | | |
| **Amber glass total (sulfuric acid)** Cartier Regional 1 - Raw | E298 | 10-Sep-2024 | 16-Sep-2024 | 28 days | 6 days | ✓ | 16-Sep-2024 | 28 days | 6 days | ✓ |
| **Anions and Nutrients : Ammonia by Fluorescence** | | | | | | | | | | |
| **Amber glass total (sulfuric acid)** Cartier Regional 2 - Treated | E298 | 10-Sep-2024 | 16-Sep-2024 | 28 days | 6 days | ✓ | 16-Sep-2024 | 28 days | 6 days | ✓ |
| **Anions and Nutrients : Bromide in Water by IC (Low Level)** | | | | | | | | | | |
| **HDPE** Cartier Regional 1 - Raw | E235.Br-L | 10-Sep-2024 | 11-Sep-2024 | 28 days | 1 days | ✓ | 11-Sep-2024 | 28 days | 1 days | ✓ |
| **Anions and Nutrients : Bromide in Water by IC (Low Level)** | | | | | | | | | | |
| **HDPE** Cartier Regional 2 - Treated | E235.Br-L | 10-Sep-2024 | 11-Sep-2024 | 28 days | 1 days | ✓ | 11-Sep-2024 | 28 days | 1 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC (Low Level)** | | | | | | | | | | |
| **HDPE** Cartier Regional 1 - Raw | E235.Cl-L | 10-Sep-2024 | 11-Sep-2024 | 28 days | 1 days | ✓ | 11-Sep-2024 | 28 days | 1 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC (Low Level)** | | | | | | | | | | |
| **HDPE** Cartier Regional 2 - Treated | E235.Cl-L | 10-Sep-2024 | 11-Sep-2024 | 28 days | 1 days | ✓ | 11-Sep-2024 | 28 days | 1 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** Cartier Regional 1 - Raw | E235.F | 10-Sep-2024 | 11-Sep-2024 | 28 days | 1 days | ✓ | 11-Sep-2024 | 28 days | 1 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group : Analytical Method / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E235.F | 10-Sep-2024 | 11-Sep-2024 | 28 days | 1 days | ✓ | 11-Sep-2024 | 28 days | 1 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC (Low Level)** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E235.NO3-L | 10-Sep-2024 | 11-Sep-2024 | 3 days | 1 days | ✓ | 11-Sep-2024 | 3 days | 1 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC (Low Level)** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E235.NO3-L | 10-Sep-2024 | 11-Sep-2024 | 3 days | 1 days | ✓ | 11-Sep-2024 | 3 days | 1 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC (Low Level)** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E235.NO2-L | 10-Sep-2024 | 11-Sep-2024 | 3 days | 1 days | ✓ | 11-Sep-2024 | 3 days | 1 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC (Low Level)** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E235.NO2-L | 10-Sep-2024 | 11-Sep-2024 | 3 days | 1 days | ✓ | 11-Sep-2024 | 3 days | 1 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E235.SO4 | 10-Sep-2024 | 11-Sep-2024 | 28 days | 1 days | ✓ | 11-Sep-2024 | 28 days | 1 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E235.SO4 | 10-Sep-2024 | 11-Sep-2024 | 28 days | 1 days | ✓ | 11-Sep-2024 | 28 days | 1 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (lab preserved)** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E358-L | 10-Sep-2024 | 12-Sep-2024 | 3 days | 2 days | ✓ | 12-Sep-2024 | 28 days | 0 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (lab preserved)** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E358-L | 10-Sep-2024 | 12-Sep-2024 | 3 days | 2 days | ✓ | 12-Sep-2024 | 28 days | 0 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group : Analytical Method / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass total (sulfuric acid)** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E355-L | 10-Sep-2024 | 12-Sep-2024 | 28 days | 2 days | ✓ | 12-Sep-2024 | 28 days | 2 days | ✓ |
| **Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass total (sulfuric acid)** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E355-L | 10-Sep-2024 | 12-Sep-2024 | 28 days | 2 days | ✓ | 12-Sep-2024 | 28 days | 2 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E290 | 10-Sep-2024 | 11-Sep-2024 | 14 days | 1 days | ✓ | 11-Sep-2024 | 14 days | 1 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E290 | 10-Sep-2024 | 11-Sep-2024 | 14 days | 1 days | ✓ | 11-Sep-2024 | 14 days | 1 days | ✓ |
| **Physical Tests : Colour (True) by Spectrometer (5 CU)** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E329 | 10-Sep-2024 | 11-Sep-2024 | 3 days | 1 days | ✓ | 11-Sep-2024 | 3 days | 1 days | ✓ |
| **Physical Tests : Colour (True) by Spectrometer (5 CU)** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E329 | 10-Sep-2024 | 11-Sep-2024 | 3 days | 1 days | ✓ | 11-Sep-2024 | 3 days | 1 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E100 | 10-Sep-2024 | 11-Sep-2024 | 28 days | 1 days | ✓ | 11-Sep-2024 | 28 days | 1 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E100 | 10-Sep-2024 | 11-Sep-2024 | 28 days | 1 days | ✓ | 11-Sep-2024 | 28 days | 1 days | ✓ |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E108 | 10-Sep-2024 | 11-Sep-2024 | 0.25 hrs | 27 hrs | × EHTR-FM | 11-Sep-2024 | 0.25 hrs | 27 hrs | × EHTR-FM |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group : Analytical Method / Container / Client Sample ID(s) | Method | Sampling Date | Extraction / Preparation | | | | Analysis | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preparation Date | Holding Times Rec | Holding Times Actual | Eval | Analysis Date | Holding Times Rec | Holding Times Actual | Eval |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E108 | 10-Sep-2024 | 11-Sep-2024 | 0.25 hrs | 27 hrs | × EHTR-FM | 11-Sep-2024 | 0.25 hrs | 27 hrs | × EHTR-FM |
| **Physical Tests : TDS by Gravimetry (Low Level)** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E162-L | 10-Sep-2024 | ---- | ---- | ---- | | 12-Sep-2024 | 7 days | 2 days | ✓ |
| **Physical Tests : TDS by Gravimetry (Low Level)** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E162-L | 10-Sep-2024 | ---- | ---- | ---- | | 12-Sep-2024 | 7 days | 2 days | ✓ |
| **Physical Tests : Turbidity by Nephelometry** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E121 | 10-Sep-2024 | ---- | ---- | ---- | | 11-Sep-2024 | 3 days | 1 days | ✓ |
| **Physical Tests : Turbidity by Nephelometry** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E121 | 10-Sep-2024 | ---- | ---- | ---- | | 11-Sep-2024 | 3 days | 1 days | ✓ |
| **Physical Tests : UV Absorbance and Transmittance by Spectrometry** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E404 | 10-Sep-2024 | ---- | ---- | ---- | | 12-Sep-2024 | 3 days | 2 days | ✓ |
| **Physical Tests : UV Absorbance and Transmittance by Spectrometry** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E404 | 10-Sep-2024 | ---- | ---- | ---- | | 12-Sep-2024 | 3 days | 2 days | ✓ |
| **Total Metals : Total Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE - total (lab preserved)** | | | | | | | | | | |
| Cartier Regional 1 - Raw | E420 | 10-Sep-2024 | 12-Sep-2024 | 180 days | 2 days | ✓ | 12-Sep-2024 | 180 days | 2 days | ✓ |
| **Total Metals : Total Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE - total (lab preserved)** | | | | | | | | | | |
| Cartier Regional 2 - Treated | E420 | 10-Sep-2024 | 12-Sep-2024 | 180 days | 2 days | ✓ | 12-Sep-2024 | 180 days | 2 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| *Analyte Group : Analytical Method* / **Container / Client Sample ID(s)** | *Method* | *Sampling Date* | *Extraction / Preparation* | | | | *Analysis* | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Preparation Date* | *Holding Times* | | *Eval* | *Analysis Date* | *Holding Times* | | *Eval* |
| | | | | *Rec* | *Actual* | | | *Rec* | *Actual* | |
| **Total Metals : Total Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE - total (lab preserved)** | | | | | | | | | | |
| Cartier Regional 3 - Distribution Fanngstelle In | E420 | 10-Sep-2024 | 12-Sep-2024 | 180 days | 2 days | ✓ | 12-Sep-2024 | 180 days | 2 days | ✓ |

**Legend & Qualifier Definitions**

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

# Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: ✗ = QC frequency outside specification; ✓ = QC frequency within specification.

| Quality Control Sample Type | | | Count | | Frequency (%) | | |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC Lot #* | *QC* | *Regular* | *Actual* | *Expected* | *Evaluation* |
| **Laboratory Duplicates (DUP)** | | | | | | | |
| Alkalinity Species by Titration | E290 | 1644907 | 1 | 18 | 5.5 | 5.0 | ✓ |
| Ammonia by Fluorescence | E298 | 1653967 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Bromide in Water by IC (Low Level) | E235.Br-L | 1644528 | 0 | 2 | 0.0 | 5.0 | ✗ |
| Chloride in Water by IC (Low Level) | E235.Cl-L | 1644525 | 1 | 7 | 14.2 | 5.0 | ✓ |
| Colour (True) by Spectrometer (5 CU) | E329 | 1645755 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Conductivity in Water | E100 | 1644906 | 1 | 18 | 5.5 | 5.0 | ✓ |
| Dissolved Organic Carbon by Combustion (Low Level) | E358-L | 1647880 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 1644524 | 0 | 6 | 0.0 | 5.0 | ✗ |
| Nitrate in Water by IC (Low Level) | E235.NO3-L | 1644526 | 1 | 7 | 14.2 | 5.0 | ✓ |
| Nitrite in Water by IC (Low Level) | E235.NO2-L | 1644527 | 1 | 7 | 14.2 | 5.0 | ✓ |
| pH by Meter | E108 | 1644905 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 1644523 | 1 | 16 | 6.2 | 5.0 | ✓ |
| TDS by Gravimetry (Low Level) | E162-L | 1646762 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Total Metals in Water by CRC ICPMS | E420 | 1647321 | 0 | 14 | 0.0 | 5.0 | ✗ |
| Total Organic Carbon (Non-Purgeable) by Combustion (Low Level) | E355-L | 1647372 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Turbidity by Nephelometry | E121 | 1644554 | 1 | 20 | 5.0 | 5.0 | ✓ |
| UV Absorbance and Transmittance by Spectrometry | E404 | 1648221 | 1 | 17 | 5.8 | 5.0 | ✓ |
| **Laboratory Control Samples (LCS)** | | | | | | | |
| Alkalinity Species by Titration | E290 | 1644907 | 1 | 18 | 5.5 | 5.0 | ✓ |
| Ammonia by Fluorescence | E298 | 1653967 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Bromide in Water by IC (Low Level) | E235.Br-L | 1644528 | 1 | 2 | 50.0 | 5.0 | ✓ |
| Chloride in Water by IC (Low Level) | E235.Cl-L | 1644525 | 1 | 7 | 14.2 | 5.0 | ✓ |
| Colour (True) by Spectrometer (5 CU) | E329 | 1645755 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Conductivity in Water | E100 | 1644906 | 1 | 18 | 5.5 | 5.0 | ✓ |
| Dissolved Organic Carbon by Combustion (Low Level) | E358-L | 1647880 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 1644524 | 1 | 6 | 16.6 | 5.0 | ✓ |
| Nitrate in Water by IC (Low Level) | E235.NO3-L | 1644526 | 1 | 7 | 14.2 | 5.0 | ✓ |
| Nitrite in Water by IC (Low Level) | E235.NO2-L | 1644527 | 1 | 7 | 14.2 | 5.0 | ✓ |
| pH by Meter | E108 | 1644905 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 1644523 | 1 | 16 | 6.2 | 5.0 | ✓ |
| TDS by Gravimetry (Low Level) | E162-L | 1646762 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Total Metals in Water by CRC ICPMS | E420 | 1647321 | 1 | 14 | 7.1 | 5.0 | ✓ |
| Total Organic Carbon (Non-Purgeable) by Combustion (Low Level) | E355-L | 1647372 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Turbidity by Nephelometry | E121 | 1644554 | 1 | 20 | 5.0 | 5.0 | ✓ |
| UV Absorbance and Transmittance by Spectrometry | E404 | 1648221 | 1 | 17 | 5.8 | 5.0 | ✓ |

Matrix: **Water**

Evaluation: ✗ = QC frequency outside specification; ✓ = QC frequency within specification.

| Quality Control Sample Type | | | Count | | Frequency (%) | | |
|---|---|---|---|---|---|---|---|
| *Analytical Methods* | *Method* | *QC Lot #* | *QC* | *Regular* | *Actual* | *Expected* | *Evaluation* |
| Method Blanks (MB) | | | | | | | |
| Alkalinity Species by Titration | E290 | 1644907 | 1 | 18 | 5.5 | 5.0 | ✓ |
| Ammonia by Fluorescence | E298 | 1653967 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Bromide in Water by IC (Low Level) | E235.Br-L | 1644528 | 1 | 2 | 50.0 | 5.0 | ✓ |
| Chloride in Water by IC (Low Level) | E235.Cl-L | 1644525 | 1 | 7 | 14.2 | 5.0 | ✓ |
| Colour (True) by Spectrometer (5 CU) | E329 | 1645755 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Conductivity in Water | E100 | 1644906 | 1 | 18 | 5.5 | 5.0 | ✓ |
| Dissolved Organic Carbon by Combustion (Low Level) | E358-L | 1647880 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 1644524 | 1 | 6 | 16.6 | 5.0 | ✓ |
| Nitrate in Water by IC (Low Level) | E235.NO3-L | 1644526 | 1 | 7 | 14.2 | 5.0 | ✓ |
| Nitrite in Water by IC (Low Level) | E235.NO2-L | 1644527 | 1 | 7 | 14.2 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 1644523 | 1 | 16 | 6.2 | 5.0 | ✓ |
| TDS by Gravimetry (Low Level) | E162-L | 1646762 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Total Metals in Water by CRC ICPMS | E420 | 1647321 | 1 | 14 | 7.1 | 5.0 | ✓ |
| Total Organic Carbon (Non-Purgeable) by Combustion (Low Level) | E355-L | 1647372 | 1 | 20 | 5.0 | 5.0 | ✓ |
| Turbidity by Nephelometry | E121 | 1644554 | 1 | 20 | 5.0 | 5.0 | ✓ |
| UV Absorbance and Transmittance by Spectrometry | E404 | 1648221 | 1 | 17 | 5.8 | 5.0 | ✓ |
| Matrix Spikes (MS) | | | | | | | |
| Ammonia by Fluorescence | E298 | 1653967 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Bromide in Water by IC (Low Level) | E235.Br-L | 1644528 | 0 | 2 | 0.0 | 5.0 | ✗ |
| Chloride in Water by IC (Low Level) | E235.Cl-L | 1644525 | 1 | 7 | 14.2 | 5.0 | ✓ |
| Dissolved Organic Carbon by Combustion (Low Level) | E358-L | 1647880 | 1 | 19 | 5.2 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 1644524 | 0 | 6 | 0.0 | 5.0 | ✗ |
| Nitrate in Water by IC (Low Level) | E235.NO3-L | 1644526 | 1 | 7 | 14.2 | 5.0 | ✓ |
| Nitrite in Water by IC (Low Level) | E235.NO2-L | 1644527 | 1 | 7 | 14.2 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 1644523 | 1 | 16 | 6.2 | 5.0 | ✓ |
| Total Metals in Water by CRC ICPMS | E420 | 1647321 | 0 | 14 | 0.0 | 5.0 | ✗ |
| Total Organic Carbon (Non-Purgeable) by Combustion (Low Level) | E355-L | 1647372 | 1 | 20 | 5.0 | 5.0 | ✓ |

## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Conductivity in Water | E100<br>ALS Environmental - Winnipeg | Water | APHA 2510 (mod) | Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C. |
| pH by Meter | E108<br>ALS Environmental - Winnipeg | Water | APHA 4500-H (mod) | pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time. |
| Turbidity by Nephelometry | E121<br>ALS Environmental - Winnipeg | Water | APHA 2130 B (mod) | Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions. |
| TDS by Gravimetry (Low Level) | E162-L<br>ALS Environmental - Winnipeg | Water | APHA 2540 C (mod) | Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue. |
| Bromide in Water by IC (Low Level) | E235.Br-L<br>ALS Environmental - Winnipeg | Water | EPA 300.1 (mod) | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. |
| Chloride in Water by IC (Low Level) | E235.Cl-L<br>ALS Environmental - Winnipeg | Water | EPA 300.1 (mod) | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. |
| Fluoride in Water by IC | E235.F<br>ALS Environmental - Winnipeg | Water | EPA 300.1 (mod) | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. |
| Nitrite in Water by IC (Low Level) | E235.NO2-L<br>ALS Environmental - Winnipeg | Water | EPA 300.1 (mod) | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. |
| Nitrate in Water by IC (Low Level) | E235.NO3-L<br>ALS Environmental - Winnipeg | Water | EPA 300.1 (mod) | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. |
| Sulfate in Water by IC | E235.SO4<br>ALS Environmental - Winnipeg | Water | EPA 300.1 (mod) | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. |

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Alkalinity Species by Titration | E290<br>ALS Environmental - Winnipeg | Water | APHA 2320 B (mod) | Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. |
| Ammonia by Fluorescence | E298<br>ALS Environmental - Winnipeg | Water | Method Fialab 100, 2018 | Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021) |
| Colour (True) by Spectrometer (5 CU) | E329<br>ALS Environmental - Winnipeg | Water | APHA 2120 C (mod) | Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. |
| Total Organic Carbon (Non-Purgeable) by Combustion (Low Level) | E355-L<br>ALS Environmental - Winnipeg | Water | APHA 5310 B (mod) | Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of $CO_2$. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC). |
| Dissolved Organic Carbon by Combustion (Low Level) | E358-L<br>ALS Environmental - Winnipeg | Water | APHA 5310 B (mod) | Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of $CO_2$. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC). |
| UV Absorbance and Transmittance by Spectrometry | E404<br>ALS Environmental - Winnipeg | Water | APHA 5910 B (mod) | UV Absorbance is determined by first filtering a sample through a 0.45 micron filter, followed by UV absorbance measurement in a quartz cell at 254 nm. The analysis is carried out without pH adjustment. |
| Total Metals in Water by CRC ICPMS | E420<br>ALS Environmental - Winnipeg | Water | EPA 200.2/6020B (mod) | Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.<br><br>Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method. |
| Hardness (Calculated) from Total Ca/Mg | EC100A<br>ALS Environmental - Winnipeg | Water | APHA 2340B | "Hardness (as $CaCO_3$), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters. |

| Analytical Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Ion Balance using Total Metals | EC101A<br>ALS Environmental - Winnipeg | Water | APHA 1030E | Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC). |
| Saturation Index using Laboratory pH (Ca-T) | EC105A<br>ALS Environmental - Winnipeg | Water | APHA 2330B | Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO3. Negative values indicate undersaturation of CaCO3. This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. Ryznar Stability Index is an alternative index used for scale formation and corrosion potential. |

| Preparation Methods | Method / Lab | Matrix | Method Reference | Method Descriptions |
|---|---|---|---|---|
| Preparation for Ammonia | EP298<br>ALS Environmental - Winnipeg | Water | | Sample preparation for Preserved Nutrients Water Quality Analysis. |
| Preparation for Total Organic Carbon by Combustion | EP355<br>ALS Environmental - Winnipeg | Water | | Preparation for Total Organic Carbon by Combustion |
| Preparation for Dissolved Organic Carbon for Combustion | EP358<br>ALS Environmental - Winnipeg | Water | APHA 5310 B (mod) | Preparation for Dissolved Organic Carbon |

# QUALITY CONTROL REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **WP2421707** | Page | : 1 of 9 |
| Client | : Manitoba Conservation & Climate | Laboratory | : ALS Environmental - Winnipeg |
| Contact | : Amanda Fewings | Account Manager | : Sheriza Rajack-Ahamed |
| Address | : 36.00 - Cartier Regional - PWS Box 217<br>St. Eustache MB Canada R0H 1H0 | Address | : 1329 Niakwa Road East, Unit 12<br>Winnipeg, Manitoba Canada R2J 3T4 |
| Telephone | : 204 795 9614 | Telephone | : +1 204 255 9720 |
| Project | : CARTIER REGIONAL - PWS 36.00 | Date Samples Received | : 10-Sep-2024 15:27 |
| PO | : ---- | Date Analysis Commenced | : 11-Sep-2024 |
| C-O-C number | : ---- | Issue Date | : 07-Oct-2024 13:41 |
| Sampler | : Grant McGorman | | |
| Site | : Cartier Regional - PWS 36.00 Op ID: 28128 | | |
| Quote number | : 2024 WTP Chemistry | | |
| No. of samples received | : 3 | | |
| No. of samples analysed | : 3 | | |

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

| *Signatories* | *Position* | *Laboratory Department* |
|---|---|---|
| Christopher Chow | | Winnipeg Inorganics, Winnipeg, Manitoba |
| Oleksandr Busel | | Winnipeg Inorganics, Winnipeg, Manitoba |
| Oleksandr Busel | | Winnipeg Metals, Winnipeg, Manitoba |

## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

## Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

| | | | | | Laboratory Duplicate (DUP) Report | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | LOR | Unit | Original Result | Duplicate Result | RPD(%) or Difference | Duplicate Limits | Qualifier |
| **Physical Tests (QC Lot: 1644554)** | | | | | | | | | | | |
| WP2421648-007 | Anonymous | Turbidity | ---- | E121 | 0.10 | NTU | 89.9 | 86.2 | 4.13% | 15% | ---- |
| **Physical Tests (QC Lot: 1644905)** | | | | | | | | | | | |
| WP2421706-001 | Anonymous | pH | ---- | E108 | 0.10 | pH units | 8.20 | 8.17 | 0.366% | 4% | ---- |
| **Physical Tests (QC Lot: 1644906)** | | | | | | | | | | | |
| WP2421706-001 | Anonymous | Conductivity | ---- | E100 | 2.0 | µS/cm | 1680 | 1680 | 0.119% | 10% | ---- |
| **Physical Tests (QC Lot: 1644907)** | | | | | | | | | | | |
| WP2421706-001 | Anonymous | Alkalinity, total (as CaCO3) | ---- | E290 | 1.0 | mg/L | 279 | 280 | 0.250% | 20% | ---- |
| **Physical Tests (QC Lot: 1645755)** | | | | | | | | | | | |
| WP2421547-001 | Anonymous | Colour, true | ---- | E329 | 5.0 | CU | <5.0 | <5.0 | 0 | Diff <2x LOR | ---- |
| **Physical Tests (QC Lot: 1646762)** | | | | | | | | | | | |
| WP2421706-001 | Anonymous | Solids, total dissolved [TDS] | ---- | E162-L | 15.0 | mg/L | 897 | 904 | 0.833% | 20% | ---- |
| **Physical Tests (QC Lot: 1648221)** | | | | | | | | | | | |
| WP2421706-001 | Anonymous | Absorbance, UV (@ 254nm) | ---- | E404 | 0.0050 | AU/cm | 0.0530 | 0.0540 | 1.87% | 20% | ---- |
| **Anions and Nutrients (QC Lot: 1644523)** | | | | | | | | | | | |
| WP2421714-001 | Anonymous | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.30 | mg/L | 182 | 183 | 0.228% | 20% | ---- |
| **Anions and Nutrients (QC Lot: 1644525)** | | | | | | | | | | | |
| WP2421714-001 | Anonymous | Chloride | 16887-00-6 | E235.Cl-L | 0.10 | mg/L | 23.9 | 23.8 | 0.441% | 20% | ---- |
| **Anions and Nutrients (QC Lot: 1644526)** | | | | | | | | | | | |
| WP2421714-001 | Anonymous | Nitrate (as N) | 14797-55-8 | E235.NO3-L | 0.0050 | mg/L | 0.529 | 0.529 | 0.0930% | 20% | ---- |
| **Anions and Nutrients (QC Lot: 1644527)** | | | | | | | | | | | |
| WP2421714-001 | Anonymous | Nitrite (as N) | 14797-65-0 | E235.NO2-L | 0.0010 | mg/L | 0.0231 | 0.0236 | 2.19% | 20% | ---- |
| **Anions and Nutrients (QC Lot: 1653967)** | | | | | | | | | | | |
| WP2421364-001 | Anonymous | Ammonia, total (as N) | 7664-41-7 | E298 | 0.0050 | mg/L | 0.0137 | 0.0124 | 0.0013 | Diff <2x LOR | ---- |
| **Organic / Inorganic Carbon (QC Lot: 1647372)** | | | | | | | | | | | |
| WP2421528-001 | Anonymous | Carbon, total organic [TOC] | ---- | E355-L | 0.50 | mg/L | 12.4 | 12.0 | 3.19% | 20% | ---- |
| **Organic / Inorganic Carbon (QC Lot: 1647880)** | | | | | | | | | | | |
| WP2421707-001 | Cartier Regional 1 - Raw | Carbon, dissolved organic [DOC] | ---- | E358-L | 0.50 | mg/L | 9.43 | 11.0 | 14.9% | 20% | ---- |

## Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **Physical Tests (QCLot: 1644554)** | | | | | | |
| Turbidity | ---- | E121 | 0.1 | NTU | <0.10 | ---- |
| **Physical Tests (QCLot: 1644906)** | | | | | | |
| Conductivity | ---- | E100 | 1 | µS/cm | <1.0 | ---- |
| **Physical Tests (QCLot: 1644907)** | | | | | | |
| Alkalinity, total (as CaCO3) | ---- | E290 | 1 | mg/L | <1.0 | ---- |
| **Physical Tests (QCLot: 1645755)** | | | | | | |
| Colour, true | ---- | E329 | 5 | CU | <5.0 | ---- |
| **Physical Tests (QCLot: 1646762)** | | | | | | |
| Solids, total dissolved [TDS] | ---- | E162-L | 3 | mg/L | <3.0 | ---- |
| **Physical Tests (QCLot: 1648221)** | | | | | | |
| Absorbance, UV (@ 254nm) | ---- | E404 | 0.005 | AU/cm | <0.0050 | ---- |
| **Anions and Nutrients (QCLot: 1644523)** | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | <0.30 | ---- |
| **Anions and Nutrients (QCLot: 1644524)** | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | <0.020 | ---- |
| **Anions and Nutrients (QCLot: 1644525)** | | | | | | |
| Chloride | 16887-00-6 | E235.Cl-L | 0.1 | mg/L | <0.10 | ---- |
| **Anions and Nutrients (QCLot: 1644526)** | | | | | | |
| Nitrate (as N) | 14797-55-8 | E235.NO3-L | 0.005 | mg/L | <0.0050 | ---- |
| **Anions and Nutrients (QCLot: 1644527)** | | | | | | |
| Nitrite (as N) | 14797-65-0 | E235.NO2-L | 0.001 | mg/L | <0.0010 | ---- |
| **Anions and Nutrients (QCLot: 1644528)** | | | | | | |
| Bromide | 24959-67-9 | E235.Br-L | 0.05 | mg/L | <0.050 | ---- |
| **Anions and Nutrients (QCLot: 1653967)** | | | | | | |
| Ammonia, total (as N) | 7664-41-7 | E298 | 0.005 | mg/L | <0.0050 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1647372)** | | | | | | |
| Carbon, total organic [TOC] | ---- | E355-L | 0.5 | mg/L | <0.50 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1647880)** | | | | | | |
| Carbon, dissolved organic [DOC] | ---- | E358-L | 0.5 | mg/L | <0.50 | ---- |
| **Total Metals (QCLot: 1647321)** | | | | | | |
| Aluminum, total | 7429-90-5 | E420 | 0.003 | mg/L | <0.0030 | ---- |

Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **Total Metals (QCLot: 1647321) - continued** | | | | | | |
| Antimony, total | 7440-36-0 | E420 | 0.0001 | mg/L | <0.00010 | ---- |
| Arsenic, total | 7440-38-2 | E420 | 0.0001 | mg/L | <0.00010 | ---- |
| Barium, total | 7440-39-3 | E420 | 0.0001 | mg/L | <0.00010 | ---- |
| Beryllium, total | 7440-41-7 | E420 | 0.00002 | mg/L | <0.000020 | ---- |
| Bismuth, total | 7440-69-9 | E420 | 0.00005 | mg/L | <0.000050 | ---- |
| Boron, total | 7440-42-8 | E420 | 0.01 | mg/L | <0.010 | ---- |
| Cadmium, total | 7440-43-9 | E420 | 0.000005 | mg/L | <0.0000050 | ---- |
| Calcium, total | 7440-70-2 | E420 | 0.05 | mg/L | <0.050 | ---- |
| Cesium, total | 7440-46-2 | E420 | 0.00001 | mg/L | <0.000010 | ---- |
| Chromium, total | 7440-47-3 | E420 | 0.0005 | mg/L | <0.00050 | ---- |
| Cobalt, total | 7440-48-4 | E420 | 0.0001 | mg/L | <0.00010 | ---- |
| Copper, total | 7440-50-8 | E420 | 0.0005 | mg/L | <0.00050 | ---- |
| Iron, total | 7439-89-6 | E420 | 0.01 | mg/L | <0.010 | ---- |
| Lead, total | 7439-92-1 | E420 | 0.00005 | mg/L | <0.000050 | ---- |
| Lithium, total | 7439-93-2 | E420 | 0.001 | mg/L | <0.0010 | ---- |
| Magnesium, total | 7439-95-4 | E420 | 0.005 | mg/L | <0.0050 | ---- |
| Manganese, total | 7439-96-5 | E420 | 0.0001 | mg/L | <0.00010 | ---- |
| Molybdenum, total | 7439-98-7 | E420 | 0.00005 | mg/L | <0.000050 | ---- |
| Nickel, total | 7440-02-0 | E420 | 0.0005 | mg/L | <0.00050 | ---- |
| Phosphorus, total | 7723-14-0 | E420 | 0.05 | mg/L | <0.050 | ---- |
| Potassium, total | 7440-09-7 | E420 | 0.05 | mg/L | <0.050 | ---- |
| Rubidium, total | 7440-17-7 | E420 | 0.0002 | mg/L | <0.00020 | ---- |
| Selenium, total | 7782-49-2 | E420 | 0.00005 | mg/L | <0.000050 | ---- |
| Silicon, total | 7440-21-3 | E420 | 0.1 | mg/L | <0.10 | ---- |
| Silver, total | 7440-22-4 | E420 | 0.00001 | mg/L | <0.000010 | ---- |
| Sodium, total | 7440-23-5 | E420 | 0.05 | mg/L | <0.050 | ---- |
| Strontium, total | 7440-24-6 | E420 | 0.0002 | mg/L | <0.00020 | ---- |
| Sulfur, total | 7704-34-9 | E420 | 0.5 | mg/L | <0.50 | ---- |
| Tellurium, total | 13494-80-9 | E420 | 0.0002 | mg/L | <0.00020 | ---- |
| Thallium, total | 7440-28-0 | E420 | 0.00001 | mg/L | <0.000010 | ---- |
| Thorium, total | 7440-29-1 | E420 | 0.0001 | mg/L | <0.00010 | ---- |
| Tin, total | 7440-31-5 | E420 | 0.0001 | mg/L | <0.00010 | ---- |
| Titanium, total | 7440-32-6 | E420 | 0.0003 | mg/L | <0.00030 | ---- |
| Tungsten, total | 7440-33-7 | E420 | 0.0001 | mg/L | <0.00010 | ---- |
| Uranium, total | 7440-61-1 | E420 | 0.00001 | mg/L | <0.000010 | ---- |

Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **Total Metals (QCLot: 1647321) - continued** | | | | | | |
| Vanadium, total | 7440-62-2 | E420 | 0.0005 | mg/L | <0.00050 | ---- |
| Zinc, total | 7440-66-6 | E420 | 0.003 | mg/L | <0.0030 | ---- |
| Zirconium, total | 7440-67-7 | E420 | 0.0002 | mg/L | <0.00020 | ---- |

## Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Target Concentration | LCS | Low | High | Qualifier |
| **Physical Tests (QCLot: 1644554)** | | | | | | | | | |
| Turbidity | ---- | E121 | 0.1 | NTU | 200 NTU | 103 | 85.0 | 115 | ---- |
| **Physical Tests (QCLot: 1644905)** | | | | | | | | | |
| pH | ---- | E108 | ---- | pH units | 7 pH units | 101 | 98.0 | 102 | ---- |
| **Physical Tests (QCLot: 1644906)** | | | | | | | | | |
| Conductivity | ---- | E100 | 1 | µS/cm | 1410 µS/cm | 99.0 | 90.0 | 110 | ---- |
| **Physical Tests (QCLot: 1644907)** | | | | | | | | | |
| Alkalinity, total (as CaCO3) | ---- | E290 | 1 | mg/L | 100 mg/L | 102 | 85.0 | 115 | ---- |
| **Physical Tests (QCLot: 1645755)** | | | | | | | | | |
| Colour, true | ---- | E329 | 5 | CU | 250 CU | 105 | 85.0 | 115 | ---- |
| **Physical Tests (QCLot: 1646762)** | | | | | | | | | |
| Solids, total dissolved [TDS] | ---- | E162-L | 3 | mg/L | 1000 mg/L | 96.6 | 85.0 | 115 | ---- |
| **Physical Tests (QCLot: 1648221)** | | | | | | | | | |
| Absorbance, UV (@ 254nm) | ---- | E404 | 0.005 | AU/cm | 0.582 AU/cm | 96.9 | 85.0 | 115 | ---- |
| **Anions and Nutrients (QCLot: 1644523)** | | | | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | 100 mg/L | 98.2 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1644524)** | | | | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | 1 mg/L | 101 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1644525)** | | | | | | | | | |
| Chloride | 16887-00-6 | E235.Cl-L | 0.1 | mg/L | 100 mg/L | 98.2 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1644526)** | | | | | | | | | |
| Nitrate (as N) | 14797-55-8 | E235.NO3-L | 0.005 | mg/L | 2.5 mg/L | 97.9 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1644527)** | | | | | | | | | |
| Nitrite (as N) | 14797-65-0 | E235.NO2-L | 0.001 | mg/L | 0.5 mg/L | 97.4 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1644528)** | | | | | | | | | |
| Bromide | 24959-67-9 | E235.Br-L | 0.05 | mg/L | 0.5 mg/L | 100 | 85.0 | 115 | ---- |
| **Anions and Nutrients (QCLot: 1653967)** | | | | | | | | | |
| Ammonia, total (as N) | 7664-41-7 | E298 | 0.005 | mg/L | 0.2 mg/L | 99.8 | 85.0 | 115 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1647372)** | | | | | | | | | |
| Carbon, total organic [TOC] | ---- | E355-L | 0.5 | mg/L | 8.57 mg/L | 108 | 80.0 | 120 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1647880)** | | | | | | | | | |

Sub-Matrix: **Water**

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Target Concentration | LCS | Low | High | Qualifier |
| **Organic / Inorganic Carbon (QCLot: 1647880) - continued** | | | | | | | | | |
| Carbon, dissolved organic [DOC] | ---- | E358-L | 0.5 | mg/L | 8.57 mg/L | 100 | 80.0 | 120 | ---- |
| **Total Metals (QCLot: 1647321)** | | | | | | | | | |
| Aluminum, total | 7429-90-5 | E420 | 0.003 | mg/L | 2 mg/L | 92.8 | 80.0 | 120 | ---- |
| Antimony, total | 7440-36-0 | E420 | 0.0001 | mg/L | 1 mg/L | 103 | 80.0 | 120 | ---- |
| Arsenic, total | 7440-38-2 | E420 | 0.0001 | mg/L | 1 mg/L | 98.8 | 80.0 | 120 | ---- |
| Barium, total | 7440-39-3 | E420 | 0.0001 | mg/L | 0.25 mg/L | 106 | 80.0 | 120 | ---- |
| Beryllium, total | 7440-41-7 | E420 | 0.00002 | mg/L | 0.1 mg/L | 89.4 | 80.0 | 120 | ---- |
| Bismuth, total | 7440-69-9 | E420 | 0.00005 | mg/L | 1 mg/L | 106 | 80.0 | 120 | ---- |
| Boron, total | 7440-42-8 | E420 | 0.01 | mg/L | 1 mg/L | 84.3 | 80.0 | 120 | ---- |
| Cadmium, total | 7440-43-9 | E420 | 0.000005 | mg/L | 0.1 mg/L | 97.5 | 80.0 | 120 | ---- |
| Calcium, total | 7440-70-2 | E420 | 0.05 | mg/L | 50 mg/L | 94.8 | 80.0 | 120 | ---- |
| Cesium, total | 7440-46-2 | E420 | 0.00001 | mg/L | 0.05 mg/L | 102 | 80.0 | 120 | ---- |
| Chromium, total | 7440-47-3 | E420 | 0.0005 | mg/L | 0.25 mg/L | 91.2 | 80.0 | 120 | ---- |
| Cobalt, total | 7440-48-4 | E420 | 0.0001 | mg/L | 0.25 mg/L | 92.0 | 80.0 | 120 | ---- |
| Copper, total | 7440-50-8 | E420 | 0.0005 | mg/L | 0.25 mg/L | 90.7 | 80.0 | 120 | ---- |
| Iron, total | 7439-89-6 | E420 | 0.01 | mg/L | 1 mg/L | 89.4 | 80.0 | 120 | ---- |
| Lead, total | 7439-92-1 | E420 | 0.00005 | mg/L | 0.5 mg/L | 100 | 80.0 | 120 | ---- |
| Lithium, total | 7439-93-2 | E420 | 0.001 | mg/L | 0.25 mg/L | 80.4 | 80.0 | 120 | ---- |
| Magnesium, total | 7439-95-4 | E420 | 0.005 | mg/L | 50 mg/L | 94.2 | 80.0 | 120 | ---- |
| Manganese, total | 7439-96-5 | E420 | 0.0001 | mg/L | 0.25 mg/L | 91.4 | 80.0 | 120 | ---- |
| Molybdenum, total | 7439-98-7 | E420 | 0.00005 | mg/L | 0.25 mg/L | 99.6 | 80.0 | 120 | ---- |
| Nickel, total | 7440-02-0 | E420 | 0.0005 | mg/L | 0.5 mg/L | 90.0 | 80.0 | 120 | ---- |
| Phosphorus, total | 7723-14-0 | E420 | 0.05 | mg/L | 10 mg/L | 88.9 | 80.0 | 120 | ---- |
| Potassium, total | 7440-09-7 | E420 | 0.05 | mg/L | 50 mg/L | 95.2 | 80.0 | 120 | ---- |
| Rubidium, total | 7440-17-7 | E420 | 0.0002 | mg/L | 0.1 mg/L | 103 | 80.0 | 120 | ---- |
| Selenium, total | 7782-49-2 | E420 | 0.00005 | mg/L | 1 mg/L | 91.4 | 80.0 | 120 | ---- |
| Silicon, total | 7440-21-3 | E420 | 0.1 | mg/L | 10 mg/L | 90.8 | 80.0 | 120 | ---- |
| Silver, total | 7440-22-4 | E420 | 0.00001 | mg/L | 0.1 mg/L | 91.2 | 80.0 | 120 | ---- |
| Sodium, total | 7440-23-5 | E420 | 0.05 | mg/L | 50 mg/L | 86.8 | 80.0 | 120 | ---- |
| Strontium, total | 7440-24-6 | E420 | 0.0002 | mg/L | 0.25 mg/L | 101 | 80.0 | 120 | ---- |
| Sulfur, total | 7704-34-9 | E420 | 0.5 | mg/L | 50 mg/L | 85.3 | 80.0 | 120 | ---- |
| Tellurium, total | 13494-80-9 | E420 | 0.0002 | mg/L | 0.1 mg/L | 97.6 | 80.0 | 120 | ---- |
| Thallium, total | 7440-28-0 | E420 | 0.00001 | mg/L | 1 mg/L | 101 | 80.0 | 120 | ---- |
| Thorium, total | 7440-29-1 | E420 | 0.0001 | mg/L | 0.1 mg/L | 90.7 | 80.0 | 120 | ---- |
| Tin, total | 7440-31-5 | E420 | 0.0001 | mg/L | 0.5 mg/L | 101 | 80.0 | 120 | ---- |

Sub-Matrix: **Water**

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Target Concentration | LCS | Low | High | Qualifier |
| **Total Metals (QCLot: 1647321) - continued** | | | | | | | | | |
| Titanium, total | 7440-32-6 | E420 | 0.0003 | mg/L | 0.25 mg/L | 90.0 | 80.0 | 120 | ---- |
| Tungsten, total | 7440-33-7 | E420 | 0.0001 | mg/L | 0.1 mg/L | 102 | 80.0 | 120 | ---- |
| Uranium, total | 7440-61-1 | E420 | 0.00001 | mg/L | 0.005 mg/L | 102 | 80.0 | 120 | ---- |
| Vanadium, total | 7440-62-2 | E420 | 0.0005 | mg/L | 0.5 mg/L | 94.4 | 80.0 | 120 | ---- |
| Zinc, total | 7440-66-6 | E420 | 0.003 | mg/L | 0.5 mg/L | 90.4 | 80.0 | 120 | ---- |
| Zirconium, total | 7440-67-7 | E420 | 0.0002 | mg/L | 0.1 mg/L | 96.3 | 80.0 | 120 | ---- |

## Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

| | | | | | Matrix Spike (MS) Report | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | | Recovery (%) | Recovery Limits (%) | | |
| Laboratory sample ID | Client sample ID | Analyte | CAS Number | Method | Concentration | Target | MS | Low | High | Qualifier |
| **Anions and Nutrients (QCLot: 1644523)** | | | | | | | | | | |
| WP2421714-001 | Anonymous | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | ND mg/L | ---- | ND | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1644525)** | | | | | | | | | | |
| WP2421714-001 | Anonymous | Chloride | 16887-00-6 | E235.Cl-L | 99.4 mg/L | 100 mg/L | 99.4 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1644526)** | | | | | | | | | | |
| WP2421714-001 | Anonymous | Nitrate (as N) | 14797-55-8 | E235.NO3-L | 2.48 mg/L | 2.5 mg/L | 99.2 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1644527)** | | | | | | | | | | |
| WP2421714-001 | Anonymous | Nitrite (as N) | 14797-65-0 | E235.NO2-L | 0.482 mg/L | 0.5 mg/L | 96.4 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1653967)** | | | | | | | | | | |
| WP2421364-001 | Anonymous | Ammonia, total (as N) | 7664-41-7 | E298 | 0.102 mg/L | 0.1 mg/L | 102 | 75.0 | 125 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1647372)** | | | | | | | | | | |
| WP2421528-002 | Anonymous | Carbon, total organic [TOC] | ---- | E355-L | ND mg/L | ---- | ND | 70.0 | 130 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1647880)** | | | | | | | | | | |
| WP2421707-002 | Cartier Regional 2 - Treated | Carbon, dissolved organic [DOC] | ---- | E358-L | 4.81 mg/L | 5 mg/L | 96.1 | 70.0 | 130 | ---- |

Manitoba

**Office of Drinking Water**
14 Fultz Boulevard, Winnipeg, Manitoba,
Canada R3Y 0L6

Telephone : +1 204 255 9720

2421707

**Chain of Custody (COC)**
**Manitoba Drinking Water Systems**

| | |
|---|---|
| **Regular Service (default):** | ☐ Regular Service (is 5-7 Days): |
| **Unless otherwise requested** | ☐ 1 Day, rush / priority<br>☐ 2 Day, rush / priority<br>☐ 3 Day, rush / priority |

| **Report to Operator (email PDF):** | |
|---|---|
| Contact: | Grant McGorman |
| Address: | Box 217, St. Eustache, MB R0H 1H0 |
| Phone: | (204) 353-4055 |
| Email: | gmcgorman@crwc.ca; dvaillant@crwc.ca; cartierwtp@crwc.ca; Tyler.Foxton2@gov.mb.ca |

| **Report to Owner (email PDF):** | |
|---|---|
| Contact: | Chris Fulsher |
| Address: | 6000 Portage Avenue, Headingley, MB R4H 1E8 |
| Phone: | |
| Email: | cfulsher@crwc.ca; headingleywtp@crwc.ca; angela.meier@gov.mb.ca; dvaillant@crwc.ca |

| **Email PDF copy to:** | |
|---|---|
| DWO: | Amrith Kumar |
| DWO Address: | 14 Fultz Boulevard, Winnipeg, MB R3Y0L6 |
| DWO Phone: | (204) 340-3423 |
| DWO Email: | amrith.kumar@gov.mb.ca |
| Additional Email: | Joern.Muenster@gov.mb.ca; Marc.Balcaen@gov.mb.ca; |

**If an update in Owner or Operator contact information is required, please contact your Drinking Water Officer**

| **Client / Project Information:** | **Lab:** | **Account:** | Agency Code: 382 | Report Type: EMS (Lab-MWS) | Project: DWQ-C |
|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| Operation Name: | CARTIER REGIONAL - PWS | Expected Sample Time: | September ~~May-2024~~ |
| Operation Code: | 36.00 | | |
| Operation ID: | 28128 | | |
| Sampled by: | Grant McGorman | | |

**Please record Free & Total Chlorine residuals for Distribution By-product Sampling**

**DO NOT COPY or RE-USE this form. Sample Number are unique to the Office of Drinking Water and provided by Drinking Water Officer.**

| Sample Number | Station Number | Sample Identification | Free Chlorine (mg/L) | Total Chlorine (mg/L) | Sample Date dd-mmm-yyyy | Sample Time hh:mm | Sample Matrix | Sample Type | MB-CH-PWS-V2013 | MB-MET-T-CCMS | # of Containers |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2405AF5001 | MB05MJD041 | Cartier Regional 1 - Raw | — | — | 10-SEP-2024 | 8:15am | 6 | 1 | X | | 4 |
| 2405AF5002 | MB05MJD042 | Cartier Regional 2 - Treated | 1.56 | 1.73 | 10-SEP-2024 | 8:30am | 10 | 1 | X | | 4 |
| 2405AF5003 | MB05MJD043 | Cartier Regional 3 - Distribution Fannystelle In | 1.35 | 1.52 | 10-SEP-2024 | 7:00am | 9 | 1 | | X | 1 |

| | | | | | |
|---|---|---|---|---|---|
| **Failure to complete all portions of this form may delay analysis.** | | | Sample Matrix: | 6-Raw Water, 9-Distributed Water, 10-Treated Water | |
| **Please fill in this form LEGIBLY.** | | | Sample Type: | 1-Grab Sample | |
| **By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified by the Laboratory.** | | | | | |
| **For ALL other testing, please use Laboratory specific forms.** | | | | | |
| Relinquished By: | Scott Caster | Date & Time | September 10/2024 2:16 PM | Validated By (lab use only): | Date & Time: |
| | | | | Sample Condition (lab use only) | |
| Received By: (lab use only) | Ledinghan | Date & Time: (lab use only) | 15:27 SEP 10 2024 | Temperature 21.0C | Samples Received in Good Condition? (Y) / N |

## Sample Intake

| | | | | | | |
|---|---|---|---|---|---|---|
| Client: O.D.W | | | | | COC receipt info complete | ☑ |
| Express TAT? | no | same day | 1 day | Yes: 2 day | 3 days | 4 day |
| Short hold time? | no | <24 hrs | 1 day | Yes: 2 days | 3 days | 4 days |
| Matrix | Water | Soil/solid | Air | Biota | Food/micro | Other |

Total number of bottles/fractions:

| | | | |
|---|---|---|---|
| Green/white | 2x500 | Orange/black | |
| Purple/white | 2x100 | Dark blue/white | |
| Red/white | 3x125 | Black/white | |
| Dark green/white | | Brown/white | |
| Grey/white | 2x100 | Pink/white | |
| Yellow/black | | Beige/white | |
| Light blue/white | | Other (specify) | |

Comments:

21.0°C, no ice

## Sample Login

| Receipt Window | √/X | N/A | Bottles | √/X | N/A |
|---|---|---|---|---|---|
| # of fractions, matrix and submatrix | ✓ | | All received bottles have IDs | | |
| Client, office, contact, quote, project | ✓ | | Type, volume, and locations | | |
| Receipt time/date, PO, project, site | ✓ | | Labels and internal COCs printed | | |
| Temp, cooling method, sampler | ✓ | | Client Contacts | √/X | N/A |
| **Sample Info** | √/X | N/A | Report/invoice/EDD recipients | | |
| Sample date/time | ✓ | | Report types/formats | | |
| Sample ID/description | ✓ | | Post-committing | √/X | N/A |
| Sales items | ✓ | | Runs built and field data entered | | |
| Guidelines/thresholds | ✓ | | Billing information entered | | |
| Additional sample/WO information | | ✓ | Action Required? | Yes | No |
| **Due Dates** | √/X | N/A | Update default receipt data | | |
| COC/GEL/client due dates match | ✓ | | Update default report data | | |
| Express TAT surcharges | | ✓ | Add sales/billing items to quote | | |
| Clock running for all samples | ✓ | | SIF initiated (elaborate in comments) | | |

Comments: