



February 19, 2018

ISSUED FOR USE FILE: 704-ENW.VENW03150-01 Via Email: BHackwood@sd68.bc.ca

School District 68 (Nanaimo-Ladysmith) 395 Wakesiah Road Nanaimo, BC V9R 3K6

Attention: Brian Hackwood, Maintenance Manager

Subject: Domestic Water Testing (Lead) Inventory – Selby Street Daycare

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained School District 68 Nanaimo-Ladysmith (SD 68) to conduct a domestic water testing inventory at Selby Street Daycare located in SD 68. Tetra Tech understands that the BC Ministry of Education has issued a directive to protect drinking water. The directive requires that a systematic investigation of public drinking water supplies at select schools in the District be undertaken. The investigation is based on procedures set forth by Health Canada modified per the Vancouver Island Health Authority (VIHA) guidelines, to ascertain risk and mitigation.

Tetra Tech understands that the sampling schedule, collection, testing and reporting of results needs to be completed by March 1, 2018 in order to allow sufficient time for SD 68 to implement mitigation measures prior to its deadline of March 31, 2018.

Mr. Brian Hackwood, Maintenance Manager with SD 68, provided Tetra Tech with authorization to proceed with the inventory on January 18, 2018.

2.0 METHODOLOGY

Tetra Tech completed the domestic water testing inventory program at Selby Street Daycare on January 29th, 2018. The 2018 sampling program was conducted as per the protocols established during the 2016 program. The methodologies employed during the field program are detailed in the following subsections.

2.1 Sampling Locations

Tetra Tech reviewed plans for the facility prior to commencing the field work to identify potential sampling locations. The facility was then assessed in the field and sampling locations were selected based on the probability of human consumption at a location. The sampling locations included one point that was closest to the location where the water supply enters the building, one that is the furthest point from where the water supply enters the building and from points where human consumption of water occurred or was reasonably likely to occur. The sampling locations for Selby Street Daycare are shown on the attached Figure 1.

Hallway drinking fountains and kitchen sinks were all considered to have a high probability of human consumption of water and were always sampled. Sinks with visible evidence of human consumption of water, such as water bottles, cups, or electric kettles were also considered to have a high probability of human consumption of water and were sampled. Although classroom sinks (including those with water fountains) were considered to have a moderate to high probability of human consumption of water, only representative samples were collected as per the direction



of SD 68 Maintenance Manager, Mr. Brian Hackwood. Classroom laboratory and art room sinks, where present, were considered to have a low probability of human consumption of water so only representative samples were collected. Finally, washrooms and utility sinks, unless there was other evidence of human consumption of water (such as an electric kettle) were considered to be a low probability of human consumption of water and only representative samples were collected.

2.2 Drinking Water Sampling

Sampling was conducted in the early hours of Monday, January 29th, 2018 in order collect water samples representative of an approximate worse-case scenario of water that had remained in contact with the school's plumbing over the course of a weekend. Two samples were collected at each sample location; the first collected immediately prior to any water line flushing (0 second sample); the second collected after thirty seconds of water line flushing (30 second sample).

The process for the sequence of analysis for a sample location is as follows:

- Only the pre-flush (0 second) sample is initially submitted for laboratory analysis;
- If the analytical result exceeds the *Guidelines for Canadian Drinking Water Quality* (GCDQG) Maximum Allowable Concentration (MAC), the 30 second sample would be submitted for further analysis; and
- If the 30 second sample analytical result exceeds the GCDQG MAC, additional samples would be collected
 after flushing with cold water for 2 minutes and 5 minutes at a subsequent sampling event and both samples
 submitted for analysis.

Water samples were collected directly from the sample point into clean, labeled, new laboratory-supplied containers. After collecting the water, each sample then had preservative added for total lead. Sampling personnel wore new nitrile gloves prior to collecting each sample. Samples were kept in a cooler with ice after collection until being brought back to Tetra Tech's Nanaimo office, where samples not immediately submitted to the laboratory were stored in refrigerated conditions.

2.3 Analytical Testing

Samples were analyzed by Maxxam Analytics in Burnaby, British Columbia. Maxxam is a Canadian Association for Laboratory Accreditation (CALA) accredited laboratory that is qualified to analyze the samples using British Columbia Ministry of Environment (MOE)-approved procedures. All water samples submitted were analyzed for total lead.

2.4 Quality Assurance / Quality Control

During the sampling program, Tetra Tech implemented a Quality Assurance/Quality Control (QA/QC) program to ensure the integrity of the sampling methodology and analytical testing. The QA/QC program adhered to Tetra Tech's in-house Quality Management System (QMS), which was designed to generate representative samples, minimize the potential for cross-contamination between sampling locations and samples, and reduce the potential for systematic bias.

The QA/QC program included the following tasks:

- Recording the results of field activities in the field concurrently with the activities;
- Use of clean, new sampling gloves at each sampling location;





- Placing samples into new, labeled laboratory-supplied containers;
- Transporting samples to Maxxam in chilled coolers using chain-of-custody procedures;
- Using a Canadian Association for Laboratory Accreditation (CALA) accredited laboratory that is qualified to analyze the samples using MOE-approved procedures;
- Independently verifying the sample concentrations flagged by Maxxam as being greater than Health Canada guidelines by uploading laboratory results using ESdat, an environmental data management software, to minimize transcription errors; and
- Conducting a review of this report by a qualified senior Tetra Tech professional to ensure that the report meets
 Tetra Tech technical and reporting requirements.

Laboratory Quality Assurance / Quality Control Program

Water samples were submitted to Maxxam, a CALA accredited laboratory. Laboratory testing was conducted using methods outlined in the British Columbia Environmental Laboratory Manual. Laboratory QA/QC reports are attached to the laboratory reports presented in Appendix B. Samples included in the QA/QC reports consist of laboratory batches and will include random samples from the lab report and potentially other projects to complete a batch.

The Laboratories will note any sample deficiencies, such as unacceptable headspace, broken jars or bottles, etc. As well, the laboratory will measure the temperature of samples received by the laboratory in Burnaby.

Duplicate Sample – Relative Percent Difference (RPD)

A second aliquot is obtained from a randomly chosen sample. The aliquot is processed and the results expressed as the RPD between the two results. The purpose of the laboratory duplicate is to evaluate analytical precision and sample homogeneity. Tetra Tech formed the duplicate samples by alternately placing approximately 10% of the sample volume into the original sample container and then placing the same amount into the duplicate sample container. Tetra Tech continued placing additional aliquots of approximately 10% of the sample volume into each container until both containers were filled. RPDs should only be calculated and assessed when both the sample and the duplicate concentration is greater than five times the reportable detection limit (RDL), referred to as the Practical Quantification Limit (PQL).

The RPD calculations are discussed in Section 5.0. At Selby Street Daycare, duplicate sample SBDUP was collected at SB06.

3.0 ASSESSMENT STANDARDS

As per the guidance from the Vancouver Island Health Authority (VIHA), Tetra Tech compared the sample analytical results to the *Guidelines for Canadian Drinking Water Quality* (GCDQG) published by Health Canada, February 2017. The guidelines list a Maximum Acceptable Concentration (MAC) for lead of 0.010 mg/L (10 µg/L). The MAC for lead is based on chronic effects and is intended to apply to average concentrations in water consumed for extended periods. No immediately toxic concentration for lead is listed, however exposure to lead should nevertheless be kept to a minimum.





4.0 ANALYTICAL RESULTS

Tetra Tech collected water samples from the Selby Street Daycare on January 29th, 2018. A total of 7 sample locations were identified; two samples were collected at each location (i.e., 0 second sample and 30 second sample). Seven (7) pre-flush (0 second) samples (plus one pre-flush duplicate) were submitted for laboratory analysis of total lead.

One of the 0 second samples contained concentration of total lead marginally greater than the GCDWQ MAC.

Sample SB07-0s was collected from the sink closest to the door in the washroom adjacent to the foyer. The 30 second sample for this sample location was submitted for laboratory analysis of total lead.

The 30 second sample at SB-07 contained a concentration of total lead less than the GCDWQ MAC.

Sampling locations are shown on Figure 1. Laboratory testing results for Selby Street Daycare are summarized in the table below. The complete laboratory certificate is provided as Appendix B with Selby Street Daycare results found on Maxxam lab report R2510628 pages 5, 6 and 7; and Maxxam lab report R2513683 page 3.

Table 1: Laboratory Testing Results

Sample ID	Sample Date	MAC	Total Lead (µg/L)
	0 Second San	nples	
SB01-0s	1/29/2018		6.68
SB02-0s	1/29/2018		8.70
SB03-0s	1/29/2018		4.43
SB04-0s	1/29/2018	10	0.47
SB05-0s	1/29/2018	10 μg/L	2.89
SB06-0s	1/29/2018		0.42
SB07-0s	1/29/2018		10.8
SBDUP-0s	1/29/2018		0.75
	30 Second Sai	nples	
SB07-30s	1/29/2018	10 μg/L	0.65
	*duplicate samples SBDUP w	as collected at SB	06
Notes:	Grey Fill	Exceed	Is GCDWQ MAC

5.0 DISCUSSION AND RECOMMENDATIONS

Tetra Tech's sampling program was based upon guidance from the Ministry of Health, found in the document *Guidance on Controlling Corrosion in Drinking Water Distribution Systems* (2009). The rationale is that for each sampling point, if the pre-flush (0 second) sample (Tier 1) contained elevated lead concentrations, it could indicate that the faucet or fittings are the likely be the source of lead. If a subsequent 30 second flush sample (Tier 2) contained elevated lead concentrations, the source of the lead would likely be the piping (plumbing) leading to the faucet; whereas low lead concentrations in the 30 second sample would further indicate that the source was likely the faucet and fittings. Finally, a 5 minute flush sample (if required) should be drawing water directly from the water supply piping within the building and would indicate if flushing is feasible for lowering the lead concentration in water within the building.



The Health Canada guidance recommend that Tier 2 sampling (30 second samples) take place when Tier 1 sampling identifies more than 10% of sites with lead concentrations above the MAC, and then only at the 10% of sampling sites with the highest lead concentration. Rather, Tetra Tech ran every 30 second sample for locations where the 0 second sample was above the MAC to show that flushing was adequate to lower the lead concentration in the drinking water at each point of concern.

The guidance from the Ministry of Health recommended that samples be collected after the sampling points had been stagnant for a minimum of 8 hours but not longer than 24 hours in order to simulate the worst case daily scenario for lead in drinking water consumption. Based on guidance from VIHA, SD 68 directed Tetra Tech to collect samples Monday mornings prior to any staff or students arriving at the facilities in order to simulate a worst-case scenario for stagnant water. As such, lead concentrations reported represent what could be expected following a weekend and would likely be lower on subsequent weekday mornings.

One of the seven pre-flush (0 second) samples collected at Selby Street Daycare contained a concentration of lead greater than the GCDWQ MAC. The lead concentration at sample location SB07 exceeded the MAC for the 0 second samples but was below the guideline for the 30 second sample.

As previously noted, where lead concentrations are elevated in 0 second samples, the contributing source is likely the fixture (i.e., faucet or fittings). Since the lead concentration at the location noted above exceeded the MAC for the 0 second sample but not for the 30 second sample, there is potentially a lead source in the fixture.

Flushing is adequate to lower the lead concentrations at all sample points in Selby Street Daycare. Signage stating "Water Quality – First thing in the morning... Run the water for two minutes before drinking. Throughout the day... Let the water run until it is cold before drinking" should be maintained throughout the facility at each point where drinking water could be consumed.

At Selby Street Daycare, duplicate sample SBDUP was collected at SB06. The total lead concentration for both 0 second samples was below 5 times RDL of 0.20 µg/L, and as such the RPD was not calculated. Given, Maxxam's internal QA/QC process, and that the remaining duplicate samples collected throughout the program have generally met the 30% screening threshold recommended by BC Ministry of Environment Q&A, and BC Environmental Laboratory Manual, Tetra Tech considers the analytical results to be valid and re-sampling not necessary

6.0 SUMMARY AND CONCLUSIONS

One pre-flush (0 second) sample (SB07) collected at Selby Street Daycare contained a concentration of total lead greater than the GCDWQ MAC of 10µg/L (0.010 mg/L). The sample location had a concentration of lead below the MAC in the corresponding 30 second samples.

Tetra Tech recommends that SD 68 continue with its ongoing procedure of conducting a 2 minute flush at each drinking water consumption point each morning; and running taps/faucets until cold prior to consuming water. Signage stating "Water Quality – First thing in the morning... Run the water for two minutes before drinking. Throughout the day... Let the water run until it is cold before drinking" should be maintained at all water consumption points.

Tetra Tech recommends that the facility be inspected on a routine basis to ensure that the above noted signage is present and in good condition at each point where drinking water could be consumed. Tetra Tech further recommends that a bulletin be provided to staff summarizing the drinking water quality results at the facility and reminding them of the above procedure. Staff should then instruct students and visitors in the drinking water procedure.



7.0 CLOSURE

This report has been prepared based on the scope of work and for the use of School District 68, which includes distribution as required for the purposes for which this assessment was commissioned. The assessment has been carried out in accordance with generally accepted professional practice. No other warranty is made, either express or implied. Professional judgment has been applied in developing the recommendations in this report.

This report was prepared by personnel with professional experience in investigations of this nature and who specifically conducted the investigations at this Site. Reference should be made to the 'Geoenvironmental Report – Limitations on the Use of this Report' attached in Appendix A that forms a part of this report.

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted, Tetra Tech Canada Inc.

Darren Thomas, B.A.Sc., EIT. Environmental Engineer Environment Practice

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An K

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Senior Aquatic Biologist Environment Practice

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/dr

Attachments: Figure 1 - Selby Street Daycare Sample Locations

Appendix A - Limitations on the Use of this Document

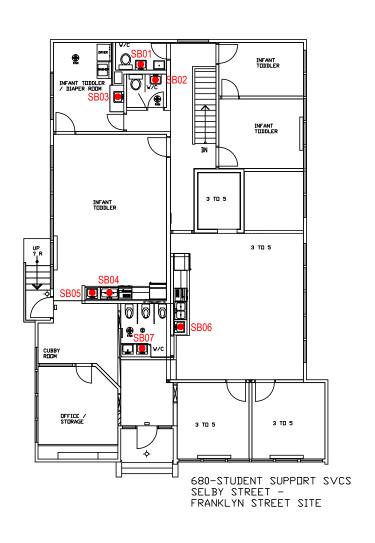
Appendix B - Laboratory Reports

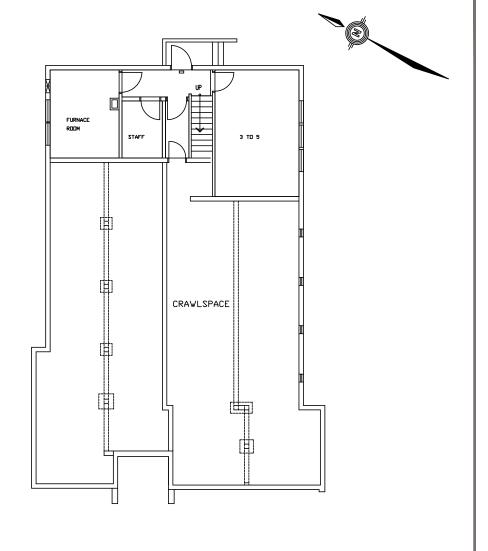


FIGURES

Figure 1 Selby Street Daycare Sample Locations







LEGEND:

- SAMPLE LOCATION

OTES

BASED ON DRAWING PROVIDED BY CLIENT
DRAWING IS NOT TO SCALE

SCHOOL DISTRICT NO 68

DOMESTIC WATER TESTING LEAD INVENTORY

685 STUDENT SUPPORT SERVICES 420 SELBY STREET, NANAIMO BC



PROJECT NO.	DWN	CKD	REV
ENW.VENW03150-01	MRV	DT	0
OFFICE	DATE		
EDM	February 1	, 2018	

Figure 1

STATUS ISSUED FOR USE



APPENDIX A

LIMITATIONS ON THE USE OF THIS DOCUMENT



LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

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1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner

consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.





APPENDIX B

LABORATORY REPORT





Your Project #: ENW.VENW03150-01
Site Location: SD68 LEAD DW TESTING

Attention: Darren Thomas
TETRA TECH CANADA INC.
#1 - 4376 BOBAN DRIVE
NANAIMO, BC
Canada V9T 6A7

Your C.O.C. #: 546212-05-01, 546212-06-01, 546212-07-01

Report Date: 2018/02/13

Report #: R2513683 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B809848 Received: 2018/02/08, 08:40

Sample Matrix: DRINKING WATER

Samples Received: 26

		Date	Date		
Analyses	Quantity	/ Extracted	Analyzed	Laboratory Method	Analytical Method
Elements by CRC ICPMS (total)	8	N/A	2018/02/09	9 BBY7SOP-00003,	EPA 6020b R2 m
Elements by CRC ICPMS (total)	18	N/A	2018/02/10) BBY7SOP-00003,	EPA 6020b R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.

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.



Your Project #: ENW.VENW03150-01
Site Location: SD68 LEAD DW TESTING

Attention: Darren Thomas

TETRA TECH CANADA INC. #1 - 4376 BOBAN DRIVE NANAIMO, BC Canada V9T 6A7

Your C.O.C. #: 546212-05-01, 546212-06-01, 546212-07-01

Report Date: 2018/02/13

Report #: R2513683 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B809848 Received: 2018/02/08, 08:40

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager. Letitia Prefontaine, B.Sc., Senior Project Manager Email: LPrefontaine@maxxam.ca Phone# (604)639-2616

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150-01
Site Location: SD68 LEAD DW TESTING

Sampler Initials: BB

Maxxam ID			SY0380	SY0381	SY0382	SY0383	SY0384	SY0385		
Sampling Date			2018/01/29 00:00	2018/01/29 00:00	2018/01/29 00:00	2018/01/29 00:00	2018/01/29 00:00	2018/01/29 00:00		
COC Number			546212-05-01	546212-05-01	546212-05-01	546212-05-01	546212-05-01	546212-05-01		
	UNITS	MAC	GA05-30S	GA06-30S	GA08-30S	GA12-30S	GA13-30S	GA16-30S	RDL	QC Batch
Total Metals by ICPMS										
Total Lead (Pb)	ug/L	10	1.41	0.58	18.8	1.23	2.45	2.17	0.20	8907050
No Fill	No Excee	dance								
Grey	Exceeds 1	L criter	ia policy/level							
Black	Exceeds b	oth cr	iteria/levels							
RDL = Reportable Detection	Limit									

Maxxam ID			SY0386	SY0387		SY0388	SY0389	SY0394		
Sampling Date			2018/01/29 00:00	2018/01/29 03:00		2018/01/29 03:00	2018/01/29 03:00	2018/01/29 03:00		
COC Number			546212-05-01	546212-05-01		546212-05-01	546212-05-01	546212-06-01		
	UNITS	MAC	GA20-30S	PA01-30S	QC Batch	PA02-30S	PA03-30S	PA07-30S	RDL	QC Batch
Total Metals by ICPMS										
Total Lead (Pb)	ug/L	10	1.15	3.18	8907050	7.31	2.93	0.79	0.20	8907060
No Fill	No Exceed	dance								
Grey	Exceeds 1	criteri	a policy/level							
Black	Black Exceeds both criteria/levels									
RDL = Reportable Detect	ion Limit									

Maxxam ID			SY0395	SY0396	SY0397	SY0398	SY0399	SY0400		
Sampling Date			2018/01/29 03:00	2018/01/29 03:00	2018/01/29 03:00	2018/01/29 03:00	2018/01/29	2018/01/29		
COC Number			546212-06-01	546212-06-01	546212-06-01	546212-06-01	546212-06-01	546212-06-01		
	UNITS	MAC	PA11-30S	PA16-30S	PA17-30S	PADUP-30S	SB07-30S	18ST05-30S	RDL	QC Batch
Total Metals by ICPMS	•		•	•	•			•		
Total Lead (Pb)	ug/L	10	0.94	1.86	5.50	5.54	0.65	0.95	0.20	8907060
No Fill	No Excee	dance								
Grey	Exceeds	1 criter	ia policy/level							
Black	Exceeds	ooth cr	iteria/levels							
RDL = Reportable Detec	ction Limit									



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150-01
Site Location: SD68 LEAD DW TESTING

Sampler Initials: BB

Maxxam ID			SY0401	SY0402	SY0403	SY0405	SY0406	SY0407		
Sampling Date			2018/01/29	2018/01/29	2018/01/29	2018/01/29	2018/01/29	2018/01/29		
COC Number			546212-06-01	546212-06-01	546212-06-01	546212-07-01	546212-07-01	546212-07-01		
	UNITS	MAC	18ST08-30S	18DC03-30S	18DC04-30S	18DC08-30S	18DC09-30S	18DC13-30S	RDL	QC Batch
Total Metals by ICPMS										
Total Lead (Pb)	ug/L	10	1.29	1.19	1.23	6.09	1.23	3.31	0.20	8907060
No Fill										
Grey	Exceeds 2	L criter	ia policy/level							
Black Exceeds both criteria/levels										
RDL = Reportable Detection	n Limit									



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150-01
Site Location: SD68 LEAD DW TESTING

Sampler Initials: BB

Maxxam ID				SY0408	SY0409	SY0410		
Sampling Date				2018/01/29	2018/01/29	2018/01/29		
COC Number				546212-07-01	546212-07-01	546212-07-01		
		UNITS	MAC	18DC17-30S	18DC18-30S	18DC20-30S	RDL	QC Batch
Total Metals by ICPMS								
Total Lead (Pb)		ug/L	10	4.38	4.91	13.3	0.20	8907060
No Fill	No Exceed	dance	•		•		=	•
Grey Exceeds 1 criteria policy/level								
Black	Exceeds b	oth crit	eria/le	vels				
RDL = Reportable Detection Limit								



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150-01
Site Location: SD68 LEAD DW TESTING

Sampler Initials: BB

GENERAL COMMENTS

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

Package 1	8.7°C
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MAC: The guidelines that have been included in this report have been taken from the Canadian Drinking Water Quality Summary Table, February 2017.

Criteria A = Maximum Acceptable Concentration (MAC) / Criteria B = Aesthetic Objectives (AO) / Criteria C = Operational Guidance Values (OG) It is recommended to consult these guidelines when interpreting your data since there are non-numerical guidelines that are not included on this report.

Turbidity Guidelines:

- 1. Chemically assisted filtration: less than or equal to 0.3 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 1.0 NTU at any time.
- 2. Slow sand / diatomaceous earth filtration: less than or equal to 1.0 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 3.0 NTU at any time.
- 3. Membrane filtration: less than or equal to 0.1 NTU in 99% of the measurements made or at least 99% of the time each calendar month. Shall not exceed 0.3 NTU at any time.

Results relate only to the items tested.



QUALITY ASSURANCE REPORT

TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150-01

Site Location: SD68 LEAD DW TESTING

Sampler Initials: BB

			Matrix	Spike	Spiked	Blank	Method B	lank	RPE)
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8907050	Total Lead (Pb)	2018/02/09	96	80 - 120	98	80 - 120	<0.20	ug/L	9.0	20
8907060	Total Lead (Pb)	2018/02/10	104	80 - 120	95	80 - 120	<0.20	ug/L	4.7	20

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.

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.



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150-01
Site Location: SD68 LEAD DW TESTING

Sampler Initials: BB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Rob Reinert, B.Sc., Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

		INVOICE TO:			Report Inform	ition			Project Informat	ion	= _	no mora de suas-cursa suas de Sala Sala Sala Sala Sala Sala Sala Sal	Page (c
pany Name		A TECH CANADA INC.	Company	Name				Quotation#	B71611 ENW.VENW03150-01			服协议放案协	ittle Order#
lact Name	Darren Thom		Contact N	ame Darren Th	omas			P.O. W					10000000
ess	#1 - 4376 BO		Address					Project #				3809848_COC	546212
	NANAIMO BO		00				Project Name		SDEG Lead	où teg	YAL	SASS	Ject Manag
ne	(250) 756-225	66 x Fax: (250) 756-26 as@tetratech.com; EBA.Labdata@	1.110110	D TI		Fax		Site #	5 0 /	6		N HANNA BERMUNDA BARNA BANK BUNG BUNG BANKA BANKA BAN	Letitia Prefonta
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egulatory Cr	teria:	The first of	Spe	cial Instructions			ANALYSIS F	EQUESTED (PLEASE	BE SPECIFIC)			Turnaround Time (TAT) Required Please provide advance notice for rush pro	
CSR CCME BC Wate	tlentth (and		Kan Kan	illered ? (Y/N)	ing Water					(will be a Standari Please r days - cr	r (Standard) TAT: applied if Rush TAT is not specified): d TAT = 5-7 Working days for most tests note: Standard TAT for contain tests such as BOD and contact your Project Manager for details. pecific Rush TAT (if applies to entire submission) 2 2 2 2 2 3 2 3 2 3 2 3 2 3 2 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Dioxins/Furans
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RELING	JUISHED BY: (Signal		Till Fol S	a um	PEDRO -	Y: (Signature/Print)		2018 D 108		rs used and t submitted Time	Setsitive Te	emperature (*C) on Receipt Custody Seel	Intact on Coole

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ac Name	Darren Thoma		c	Contact Name	Darren T	homas		<u> </u>		P.O. #						AVS
959	#1 - 4376 BOE		A	ddress						Project #		ENW03150-01	. , ,	_ B	8809848_COC	546212
	NANAIMO BC						_	3111		Project Name	SASO	De Lead	test	ns		sct Man
e	(250) 756-225	6 x Fax (250) 756-26 is@tetratech.com; EBA.Labdata@		hone	Dames T			Fax:	abdata@tetratec	Site#	7 1	1 6.	77			Letitia Prefor
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		is@tetratech.com; EBA Lab	data@tetratec	Email		mas@tetr	ateci		- Jan Pan Di	Ala		VER INDIAN	2)	C#548212-07-01	T. D	
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Your Project #: ENW.VENW03150
Site Location: SD68 DW TESTING

Attention: Ben Barton

TETRA TECH CANADA INC. #1 - 4376 BOBAN DRIVE NANAIMO, BC Canada V9T 6A7

Your C.O.C. #: 545893-11-01, 545893-12-01, 545893-13-01, 545893-14-01, 545893-15-01

Report Date: 2018/02/06 Report #: R2510628

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B807281 Received: 2018/01/30, 08:48

Sample Matrix: DRINKING WATER

Samples Received: 47

		Date	Date		
Analyses	Quantity	y Extracted	Analyzed	Laboratory Method	Analytical Method
Elements by CRC ICPMS (total)	38	N/A	2018/01/31	BBY7SOP-00003,	EPA 6020b R2 m
Elements by CRC ICPMS (total)	9	N/A	2018/02/02	2 BBY7SOP-00003,	EPA 6020b R2 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam 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.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing.

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.

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.



Your Project #: ENW.VENW03150
Site Location: SD68 DW TESTING

Attention: Ben Barton

TETRA TECH CANADA INC. #1 - 4376 BOBAN DRIVE NANAIMO, BC Canada V9T 6A7

Your C.O.C. #: 545893-11-01, 545893-12-01, 545893-13-01, 545893-14-01, 545893-15-01

Report Date: 2018/02/06 Report #: R2510628

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B807281 Received: 2018/01/30, 08:48

Encryption Key

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150 Site Location: SD68 DW TESTING

Sampler Initials: DT

Maxxam ID			SW7411	SW7412	SW7413	SW7414	SW7415	SW7416		
Sampling Date			2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00		
COC Number			545893-11-01	545893-11-01	545893-11-01	545893-11-01	545893-11-01	545893-11-01		
	UNITS	MAC	GA01-OS	GA02-OS	GA03-OS	GA04-OS	GA05-OS	GA06-OS	RDL	QC Batch
Total Metals by ICPMS	·	-	<u> </u>	•	•		•	•		
Total Lead (Pb)	ug/L	10	6.98	3.76	1.11	7.51	15.8	11.1	0.20	8898737
No Fill	No Excee	dance								
Grey	Exceeds 1	criter	ia policy/level							
Black Exceeds both criteria/levels										
RDL = Reportable Detection Limit										

Maxxam ID			SW7417	SW7418	SW7419	SW7420	SW7421	SW7422		
Sampling Date			2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00		
COC Number			545893-11-01	545893-11-01	545893-11-01	545893-11-01	545893-12-01	545893-12-01		
	UNITS	MAC	GA07-OS	GA08-OS	GA09-OS	GA10-OS	GA11-OS	GA12-OS	RDL	QC Batch
Total Metals by ICPMS										
Total Lead (Pb)	ug/L	10	6.08	20.7	4.67	0.50	6.46	10.7	0.20	8898737
No Fill	No Excee	dance								
Grey	Exceeds 2	L criter	ia policy/level							
Black	Exceeds b	oth cr	iteria/levels							
RDL = Reportable Detectio	n Limit									

RD	L =	Reporta	ble [etect	ion I	_imi1
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-										
Maxxam ID			SW7423	SW7424	SW7425	SW7426	SW7427	SW7428		
Sampling Date			2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00	2018/01/28 12:00		
COC Number			545893-12-01	545893-12-01	545893-12-01	545893-12-01	545893-12-01	545893-12-01		
	UNITS	MAC	GA13-OS	GA14-OS	GA15-OS	GA16-OS	GA17-OS	GA18-OS	RDL	QC Batch
Total Metals by ICPMS	·		-		·	-	•	•		-
Total Lead (Pb)	ug/L	10	12.5	8.13	7.87	13.2	0.55	1.59	0.20	8898737
No Fill	No Excee	dance								
Grey	Exceeds :	1 criter	ia policy/level							
Black	Exceeds l	both cr	iteria/levels							
RDL = Reportable Dete	ction Limit									



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150 Site Location: SD68 DW TESTING

Sampler Initials: DT

Maxxam ID			SW7429		SW7430	SW7439	SW7440	SW7441		
Sampling Date			2018/01/28		2018/01/28	2018/01/28	2018/01/28	2018/01/28		
Sampling Date			12:00		12:00	12:00	03:00	03:00		
COC Number			545893-12-01		545893-12-01	545893-13-01	545893-13-01	545893-13-01		
	UNITS	MAC	GA19-OS	QC Batch	GA20-OS	GADUP-OS	PA01-OS	PA02-OS	RDL	QC Batch
Total Metals by ICPMS										
Total Lead (Pb)	ug/L	10	8.22	8898737	9.32	8.78	13.7	17.3	0.20	8898755
No Fill	No Exceed	lance							-	
Grey	Exceeds 1	criteri	a policy/level							
Black Exceeds both criteria/levels										
RDL = Reportable Detection Limit										



RDL = Reportable Detection Limit

Maxxam Job #: B807281 Report Date: 2018/02/06 TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150 Site Location: SD68 DW TESTING

Sampler Initials: DT

Maxxam ID			SW7442	SW7443	SW7444	SW7445	SW7446	SW7447		
Sampling Date			2018/01/28 03:00	2018/01/28 03:00	2018/01/28 03:00	2018/01/28 03:00	2018/01/28 03:00	2018/01/28 03:00		
COC Number			545893-13-01	545893-13-01	545893-13-01	545893-13-01	545893-13-01	545893-13-01		
	UNITS	MAC	PA03-OS	PA04-OS	PA05-OS	PA06-OS	PA07-OS	PA08-OS	RDL	QC Batch
Total Metals by ICPMS		•		•	•	•	•	•		
Total Lead (Pb)	ug/L	10	18.7	6.60	1.20	1.41	15.0	4.33	0.20	8898755
No Fill	No Excee	dance								
Grey	Exceeds 1	criter	ia policy/level							
Black Exceeds both criteria/levels										
RDL = Reportable Detection Limit										

Maxxam ID			SW7448	SW7449	SW7450	SW7451	SW7452	SW7453		
Sampling Date			2018/01/28 03:00	2018/01/28 03:00	2018/01/28 03:00	2018/01/28 03:00	2018/01/28 03:00	2018/01/28 03:00		
COC Number			545893-13-01	545893-14-01	545893-14-01	545893-14-01	545893-14-01	545893-14-01		
	UNITS	MAC	PA09-OS	PA10-OS	PA11-OS	PA12-OS	PA13-OS	PA14-OS	RDL	QC Batch
Total Metals by ICPMS										
Total Wietais by ICPIVIS										
Total Lead (Pb)	ug/L	10	3.75	1.03	30.2	3.29	3.07	4.19	0.20	8898755
•	ug/L No Excee		3.75	1.03	30.2	3.29	3.07	4.19	0.20	8898755
Total Lead (Pb)	No Excee	dance	3.75	1.03	30.2	3.29	3.07	4.19	0.20	8898755

		l .							1	
Maxxam ID			SW7454	SW7455	SW7456		SW7457	SW7458		
Sampling Date			2018/01/28	2018/01/28	2018/01/28		2018/01/28	2018/01/28		
Sampling Date			03:00	03:00	03:00		03:00	05:00		
COC Number			545893-14-01	545893-14-01	545893-14-01		545893-14-01	545893-14-01		
	UNITS	MAC	PA15-OS	PA16-OS	PA17-OS	QC Batch	PADUP-OS	SB01-OS	RDL	QC Batch
Total Metals by ICPMS										
Total Lead (Pb)	ug/L	10	5.69	17.2	65.1	8898755	49.3	6.68	0.20	8898774
No Fill	No Exceed	dance								
Grey	Exceeds 1	criteri	a policy/level							
Black Exceeds both criteria/levels										
RDL = Reportable Detection Limit										



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150 Site Location: SD68 DW TESTING

Sampler Initials: DT

Maxxam ID			SW7460	SW7461	SW7462	SW7463	SW7464	SW7465		
Sampling Date			2018/01/28	2018/01/28	2018/01/28	2018/01/28	2018/01/28	2018/01/28		
Sampling Date			05:00	05:00	05:00	05:00	05:00	05:00		
COC Number			545893-15-01	545893-15-01	545893-15-01	545893-15-01	545893-15-01	545893-15-01		
	UNITS	MAC	SB02-OS	SB03-OS	SB04-OS	SB05-OS	SB06-OS	SB07-OS	RDL	QC Batch
Total Metals by ICPMS										
Total Lead (Pb)	ug/L	10	8.70	4.34	0.47	2.89	0.42	10.8	0.20	8898774
No Fill	No Excee	dance	•						-	
Grey	Exceeds 1	criter	ia policy/level							
Black Exceeds both criteria/levels										
RDL = Reportable Detectio	RDL = Reportable Detection Limit									



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150
Site Location: SD68 DW TESTING

Sampler Initials: DT

Maxxam ID				SW7466		
Sampling Da	ite			2018/01/28 05:00		
COC Numbe	r			545893-15-01		
		UNITS	MAC	SBDUP-OS	RDL	QC Batch
Total Metals	s by ICPMS					
Total Lead (F	Pb)	ug/L	10	0.75	0.20	8898774
No Fill	No Exceedance	<u>;</u>				
Grey	Exceeds 1 crite	ria polic	y/leve	I		
Black	Exceeds both c	riteria/l	evels			
RDL = Repor	table Detection L	imit				



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150
Site Location: SD68 DW TESTING

Sampler Initials: DT

GENERAL COMMENTS

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

Package 1	4.3°C

COC page 5 of 5 line # 6, SB06-OS: 1x 120mL plastic preserved with HNO3 received with incorrect labels. Sample labeled as SB07-OS, inspected as per sample label.

MAC: The guidelines that have been included in this report have been taken from the Canadian Drinking Water Quality Summary Table, February 2017.

Criteria A = Maximum Acceptable Concentration (MAC) / Criteria B = Aesthetic Objectives (AO) / Criteria C = Operational Guidance Values (OG) It is recommended to consult these guidelines when interpreting your data since there are non-numerical guidelines that are not included on this report.

Turbidity Guidelines:

- 1. Chemically assisted filtration: less than or equal to 0.3 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 1.0 NTU at any time.
- 2. Slow sand / diatomaceous earth filtration: less than or equal to 1.0 NTU in 95% of the measurements or 95% of the time each month. Shall not exceed 3.0 NTU at any time.
- 3. Membrane filtration: less than or equal to 0.1 NTU in 99% of the measurements made or at least 99% of the time each calendar month. Shall not exceed 0.3 NTU at any time.

Results relate only to the items tested.



QUALITY ASSURANCE REPORT

TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150

Site Location: SD68 DW TESTING

Sampler Initials: DT

			Matrix	Spike	Spiked	Blank	Method B	lank	RPI)
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8898737	Total Lead (Pb)	2018/01/31	97	80 - 120	98	80 - 120	<0.20	ug/L	0.40	20
8898755	Total Lead (Pb)	2018/01/31	99	80 - 120	97	80 - 120	<0.20	ug/L	2.2	20
8898774	Total Lead (Pb)	2018/02/02	93	80 - 120	102	80 - 120	<0.20	ug/L	1.5	20

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.

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.



TETRA TECH CANADA INC.

Client Project #: ENW.VENW03150 Site Location: SD68 DW TESTING

Sampler Initials: DT

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Andy Lu, Ph.D., P.Chem., Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

<i>nax</i>	Maxoam Analytics International Corporation of		Tel:(604) 734 7276	Toll-free 800-563-	6266 Fax:(604) 731 2386 ww	w maxxam ca				Chain Of Custody Recor	u	nd of	
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ontact Name	Ben Barton #1 - 4376 BOBAN DRIVE	Contact Name		V I I		P.O.#							
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