TETRA TECH

Hazardous Building Materials Assessment of the Linden Lift and Flood Pumping Station

PRESENTED TO

Winnipeg

JUNE 28, 2021
ISSUED FOR USE
FILE: 734-2100120600-REP-V0001-00

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The City of Winnipeg
Corporate Finance Department
Materials Management Division
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June 28, 2021

Matthew Randell, M.Sc.
Environmental Scientist

Authorized by:

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June 28, 2021

Brent Horning, P.Eng.
Sr. Environmental Engineer

TETRA TECH

EXECUTIVE SUMMARY

The City of Winnipeg retained Tetra Tech Canada Inc. (Tetra Tech) to complete the detailed design and contract administration for the Linden Lift and Flood Pumping Station upgrade. The Linden Lift and Flood Pumping Station (FLPS) building is located at 856 Kildonan Drive near the intersection of Linden Avenue and Kildonan Drive in the City of Winnipeg, Manitoba, herein after referred to as "the station." One component of this project was a hazardous material assessment of possible lead and mercury containing paint and potential asbestos-containing materials (ACMs). This assessment was undertaken as part of the preliminary project design stage and included manual sample collection in accordance with industry standard practices and compliance with provincial and federal health and safety guidelines to ensure that no on-site personnel were potentially exposed to these materials during sampling efforts.

The LFPS consists of a basic timber structure housing electrical and control systems, situated above underground concrete dry well, wet well, and discharge box structures.

The scope of work for the lead and mercury containing paint assessment included an initial visual inspection of the station followed by the collection of paint chip samples from accessible building materials. The visual inspection was performed on April 27, 2021 and identified the presence of seventeen different colours of paint on various pieces of equipment and the interior of the structure itself. One sample was collected from each of these paint colours/ locations. A total of 17 paint samples were submitted for laboratory analysis.

The scope of work for the ACM assessment included an initial visual inspection of the facility to identify general structural, architectural, mechanical materials that could potentially contain asbestos. This inspection was undertaken on April 27, 2021, and did not identify any materials of potential concern. No bulk building material samples were therefore collected for asbestos analysis.

The significant findings from the hazardous building materials assessment are described below.

- Analytical results for the paint samples indicated that 12 of the 17 samples collected contained lead at concentrations greater than the assessment environmental quality guidelines. One (1) of the 17 samples collected contained mercury at concentrations greater than the assessment environmental quality guidelines.
- Analyses of one representative paint chip sample for toxicity characteristic leaching procedure (TCLP), showed the sample produced a lead leachate in excess of the guideline for classification as a hazardous waste.

Based on these findings, it can be assumed that all painted metallic surfaces (e.g., pumps, pipes, railings, etc.) within the structure, the grey paint on the mounting boards/ walls around the electrical panels, and the floor paint in the motor room can be considered to be lead containing. The lead containing paint present at the site should therefore be properly encapsulated (i.e., repainted) to minimize exposure, or removed in accordance with an appropriate abatement and disposal program for any painted surfaces anticipated to be disturbed during the course of the LFPS upgrades. Based on the TCLP analytical results, all paint stripping residue should also be considered as hazardous waste, and so handled and disposed of accordingly.

Based on the apparent absence of ACMs in the structure, an asbestos management plan is not required.

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ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
ACM	Asbestos Containing Material
AMP	Asbestos Management Plan
EQG	Environmental Quality Guideline
LFPS	Lift and Flood Pumping Station
HPA	Hazardous Products Act
kg	Kilogram
LBP	Lead Based Paint
L	Litre
mg	Milligram
QA/QC	Quality Assurance/Quality Control
TCLP	Toxicity Characteristic Leaching Procedure
Tetra Tech	Tetra Tech Canada Incorporated

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the City of Winnipeg and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than the City of Winnipeg, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

The City of Winnipeg (the City) retained Tetra Tech Canada Inc. (Tetra Tech) to complete the detailed design and contract administration for the Linden Lift and Flood Pumping Station upgrade. The Linden Lift and Flood Pumping Station (LFPS) building is located at 856 Kildonan Drive near the intersection of Linden Avenue and Kildonan Drive in the City of Winnipeg, Manitoba, herein after referred to as “the station”. One component of this project was a hazardous material assessment of possible lead and mercury containing paint and potential asbestos-containing materials (ACMs).

1.1 Scope of Work

The scope of work for this assessment included the following activities.

- Preparation of a sample collection plan based on the preliminary information provided.
- An initial site walkthrough/ visual inspection of the building interior to identify potential materials of concern.
- Collection of paint chip samples from the surface of accessible building materials and equipment suspected of being coated by lead and mercury containing paint.
- Collection of bulk material samples from accessible building materials that could potentially contain asbestos, if applicable.
- Submission of samples to an appropriate analytical laboratory for confirmatory analysis.
- Preparation of a summary report which confirms the presence, location, and approximate extent of the indoor hazardous building materials.

2.0 SITE OVERVIEW

The Linden LFPS was built in the early 1950’s and is located in a residential area of Winnipeg along Kildonan Drive across from Linden Avenue on the east side of the Red River. The station consists of a single storey, open, wood framed aboveground building with a sloped wood framed roof supported by the exterior walls and interior wood beams and posts, covering approximately 66 m^2. The exterior of the building is finished with vinyl siding and asphalt shingles. The interior walls of the building are uninsulated and are covered with unfinished hardboard and plywood paneling. Portions of the north and west walls of the building include the concrete walls for the adjacent discharge box structure. The floor is painted concrete with numerous checker plate steel covers over openings to the underground infrastructure. Stairwell access to the underground dry well structure is contained within a small plywood walled vestibule. The building contains the electrical and control components for the pumps on the north, east, and south walls, and contains the top drive portions of two separately coupled, overhung impeller centrifugal pumps which have been installed in the base of the dry well.

The substructure consists of a formed concrete wet well, dry well, and discharge box. The dry well is rectangular in shape and is 6.6 m deep with a footprint area of approximately 36 m^2. This structure contains an access stairwell and ladder, supports for the two drive shafts extending down from the main floor, and two floor mounted centrifugal pumps to transfer water from the wet well to the discharge box. The substructure also contains the comms chamber, the pump chamber, and the motor room. The wet well is of similar concrete construction and underlies the north and west half of the building. The discharge box structure is located to the north and west of the building footprint.

The wet well and discharge box structures are unfinished concrete with minimal equipment, and were therefore not included in the visual inspection of the station or the material sampling program.

General site plans showing the current building configuration are provided as Figures 1 and 2 in Appendix A. Photographs of the general building layout are provided in Appendix B.

A previous hazardous materials inventory was performed by Pinchin on September 11, 2009, with records being provided to Tetra Tech by the City of Winnipeg. The results provided generally comprised a summary list of locations and items potentially associated with asbestos containing materials, and observations. Based on a review of this 2009 hazardous materials assessment, no asbestos containing materials appear to be present within the structure. Copies of the Pinchin assessment are provided in Appendix C.

3.0 INVESTIGATION METHODOLOGY

3.1 Project Scoping

Following project award, Tetra Tech undertook a review of the available information in order to develop a preliminary sampling plan of potential hazardous building materials. This included photographs compiled by Tetra Tech staff during an initial walkthrough of the building during the proposal site visit on April 14, 2021, historic LFPS construction and renovation drawings provided by the City, and the 2006 condition assessment report provided by the City. Review of the historic site drawings found no reference to the use of asbestos containing materials on-site. The condition assessment did not specifically discuss potential hazardous building materials, but did indicated the paint on the pumps and piping likely contained lead.

Using this sampling plan as a base, a general visual inspection of the LFPS was performed on April 27, 2021, to confirm the distribution of the potentially hazardous building materials identified and to confirm the extent of their distribution. Photographs of the site taken during this inspection are provided in Appendix B. During the course of this inspection, Tetra Tech staff verified and identified the following building materials that may contain potentially hazardous materials.

On the main level of the Linden LFPS building.

- Lead based paint (LBP) may be present on the following surfaces:
  - the gray paint on the electrical components;
  - the gray over brown paint on the two (2) top drive units for the dry well centrifugal pumps;
  - the gray paint on the plywood backing for the electrical components;
  - the green paint on the plywood vestibule for the stairwell;
  - the white paint on the cupboard that is attached to the green plywood vestibule;
  - the gray over blue paint on the blower;
  - the black paint on the blower stand;
  - the green paint on the conduit;
  - the blue paint on the railing;

- the brown paint on the door, door frame, and trim; and
- The gray paint on the floor;

In the dry well of the Linden LFPS building.

- Lead based paint may be present on the following surfaces:
  - the silver over orange paint on the two pumps;

In the motor room of the Linden LFPS building.

- Lead based paint may have been present on the following surfaces:
  - The blue paint on the piping and door frames;
  - The silver paint on the stairs and stair rails;
  - The red over gray paint on the floor; and
  - The white over blue paint on the walls.

In the pump chamber of the Linden LFPS building:

- Lead based paint may have been present on the following surfaces:
  - The white over blue paint on the walls;
  - The blue over red paint on the pumps and associated piping; and
  - The silver paint on the stairs and stair rails.

No potential ACMs were observed to be present in the building materials throughout the station.

3.2 Site Safety

Prior to initiation of the site inspection and material sampling activities, Tetra Tech reviewed the scope of work, job hazards, safe work practices, and emergency procedures pertaining to the tasks being conducted and the jobsite itself. The Tetra Tech staff member tasked with conducting the hazardous materials sampling waited until the station had been vacated by all persons in order to eliminate the risk of exposure to any disturbed materials. Appropriate personal protective equipment was donned for the sampling of hazardous materials.

3.3 General Sampling Procedure

Tetra Tech collected all samples of potential lead- and mercury-containing paint in accordance with the *Manitoba Workplace Safety and Health Act and Regulation,* the federal *Hazardous Products Act* (HPA), and the most current amendment of the federal *Surface Coating Materials Regulation*. A unique sample identification and number was assigned to each sample in general accordance with a sample type identifier and consecutive sample number. The identifiers for the type of sample were included in the *Sample ID*, where LBP denoted lead based paint.

3.3.1 Lead and Mercury in Paint Sample Collection

Based on the initial visual inspection of the building, areas where possible lead and mercury containing paints were observed were selected for laboratory sample collection. A single sample was collected of paints observed to be of the same colour and type present on different components throughout the building.

A total of 17 paint chip samples were collected from the subject site. Garbage bags were placed as drop sheets under the surfaces to be sampled in order to collect any paint chips that fell during sampling. Samples were collected using a scraping tool to remove a sufficient amount of sample from the relevant substrate. The collected paint chip samples were individually scraped into a clean, clearly labelled single-use, sealable plastic sample bag. The labelled sample bags were wiped clean with a wet shop wipe and placed inside a second sample bag. The sampling instruments were wiped down with a wet wipe and wiped clean using a shop wipe after the collection of each sample to prevent cross-contamination between samples. The areas under the surfaces to be sampled were cleaned using water from a spray bottle and shop wipes to collect any suspect LBP material that was not contained on the drop sheet. Used drop sheets, wipes, and any other waste materials that came in contact with suspect LBP containing materials were collected and placed in labelled garbage bags that were held by Tetra Tech until sample analysis results were received and proper disposal methods could be determined.

No paint samples were collected from the frame supporting the exhaust fan on the west side of the station and from the components in the comms chamber due to access limitations.

3.3.2 Asbestos Sample Collection

Based on the initial visual inspection of the building, no potential ACMSs were observed to be present in the building materials throughout the station, therefore no ACM samples were collected

3.3.3 Field Quality Assurance/Quality Control

Field Quality Assurance/Quality Control (QA/QC) procedures taken by Tetra Tech field staff included the cleaning of sampling equipment, and sample collection, handling, and management procedures, as summarized below.

- New, clean, disposable nitrile gloves were worn when handling samples or sampling equipment. New gloves were donned for every sample collected.
- New, clean sampling containers were used to collect each sample.
- Sampling instruments were cleaned after the collection of each sample to prevent cross-contamination between samples.
- Sample containers submitted for laboratory analysis were identified using weatherproof labels and recorded on the laboratory chain of custody forms.

3.4 Laboratory Submission and Analysis

Upon completion of sampling activities, all samples were submitted to ALS Environmental Laboratories in Winnipeg, Manitoba for analysis. Paint chip samples were submitted for analysis of lead in paint and mercury in paint.

3.5 Applicable Guidelines

Analytical results for the paint chip samples were reviewed relative to the federal *Hazardous Products Act* (HPA) (R.S.C, 1985, c. H-3) (Government of Canada, 1985), and the most current amendment of the federal *Surface Coating Materials Regulation* (SOR/2016-193) (Government of Canada, 2016). In accordance with these guidelines, the level of total lead allowed in paints and other surface coating materials is 90 mg/kg, and the level of total mercury allowed in paints must not exceed 10 mg/kg.

If analytical results confirm that lead and mercury are present at elevated concentrations in the submitted paint chip samples, toxicity characteristic leaching procedure (TCLP) analyses is required to determine the waste classification as either industrial or hazardous waste.In accordance with *The Dangerous Goods Handling and Transportation Act (C.C.S.M. c. D12) Hazardous Waste Regulation* (Government of Manitoba, 2015), a material containing lead or mercury at a TCLP concentration which exceeds 5 mg/L and 0.1 mg/L respectively, is classified as category 4 level hazardous waste, and must be disposed of at an appropriate waste management site.

4.0 SAMPLE RESULTS

The laboratory results for the paint samples are summarized in Tables 1 and 2, as presented in Appendix D. Approximate sample locations are shown graphically on Figures 1 and 2 provided in Appendix A. The formal laboratory analytical reports and chain-of-custody forms for all samples submitted for analyses are provided in Appendix E.

4.1 Paint Sample Results

The analytical results of the paint samples are presented in the units of mg/kg for both lead and mercury in paint. Of the 17 samples submitted for lead analysis, analytical results for 12 of the samples collected identified lead in paint at a concentration between 260 mg/kg and 112,000 mg/kg, significantly greater than the assessment environmental quality guideline of 90 mg/kg. Painted materials from the main level that exceeded assessment environmental quality guidelines (EQGs) included the following.

- gray paint from the electrical components,
- gray over brown paint from the top drive units,
- gray paint on the plywood backing for the electrical panels,
- gray over blue paint on the blower pipe,
- black paint on the blower stand,
- green paint on the conduit, and
- blue paint on the railing.

Painted materials in the dry well that exceeded assessment EQGs included only silver over orange paint on the pumps and associated piping.

Painted materials in the motor room that exceeded assessment EQGs included blue paint on the piping and door frames, silver paint on the stairs and stair rails, and red over gray paint on the floor.

Painted materials in the pump chamber that exceeded assessment EQGs included blue over red paint on the pumps and associated piping, and silver paint on the stairs and stair rails.

In general, the painted surfaces showing elevated lead concentrations on the main floor were in fair to good condition with no significant indications of paint flaking. The paint on the blower (gray over blue) and blower stand frame (black) did however appear to be in poor condition with extensive chipping and flaking. The paint on the pumps in the dry well (silver over orange) was in poor condition with extensive chipping and flaking. The painted surfaces showing elevated lead concentrations in the motor room varied between poor to fair condition. The paint on the piping (blue) and the stairs and stair rails (silver) appeared to be in fair condition with some chipping and physical damage. The paint on the on the floor (red over grey) appeared to be in poor condition with extensive chipping and flaking. The painted surfaces showing elevated lead concentrations in the pump chamber varied between poor to fair condition. The paint on the pumps (blue over red over teal) appeared to be in poor condition with extensive chipping and flaking. The paint on the stairs and stair rails (silver) appeared to be in fair condition with some chipping and physical damage.

Of the 17 samples submitted for mercury analysis, analytical results for one (1) sample collected identified mercury in paint at a concentration greater than the assessment EQG of 10 mg/kg; sample LBP-09, green paint from the conduit pipe in the main floor identified mercury in paint at a concentration of 763 mg/kg. This paint sample also contained an elevated lead concentration.

Of the 17 samples submitted for lead analysis, five (5) samples collected identified lead in paint at concentrations below the assessment EQGs. Painted materials from the main level that did not exceed assessment EQGs included:

- green paint on the plywood vestibule,
- white paint on the cupboard attached to the plywood vestibule,
- brown paint from the door and door frame, and
- grey paint on the concrete floor.

Painted materials from the pump and motor rooms that did not exceed the assessment EQGs included white over blue paint on the walls.

4.1.1 Paint Sample Leachate Analysis

As a lead containing substance, federal and provincial Transportation of Dangerous Goods and industrial waste disposal regulations require an assessment of the potential for the lead and mercury contained in the paint to be adsorbed by exposure to water. One (1) paint sample was submitted for TCLP analyses to determine if following removal of the paint (if performed), this material could be handled and disposed of as an industrial waste or if it would have to be classified as a hazardous waste.

Analytical results for the paint chip sample submitted for TCLP identified lead leachate at a concentration greater than the Manitoba guideline of 5.0 mg/L for the classification of hazardous waste.

- Sample LBP-14, the silver over orange paint on the pumps in the dry well produced a lead concentration of 76.4 mg/L.

Analyses of the paint sample for mercury by TCLP showed non-detectable results, below the applicable guideline value of 0.1 mg/L.

4.2 Laboratory Quality Assurance/Quality Control

Each laboratory report provided by ALS Environmental includes a Quality Control Report confirming that equipment and method checks were within acceptable performance specifications. The ALS Environmental Quality Assurance Report is included at the back of the Analytical Laboratory Report provided in Appendix E. Laboratory detection limits were raised in paint chip samples LBP-07, LBP-09, LBP-10, LBP-14, and LBP-19 due to high concentrations of the test analytes. Extraction fluid and/ or other elements of the TCLP method were scaled down proportionately for paint chip sample LBP-14 to permit analysis due to limited sample available. Due to this sample volume limitation, the test results from the modified TCLP procedures may be unsuitable for regulatory purposes, but are still considered to be indicative of an elevated TCLP potential.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Construction of the Linden Lift and Flood Pumping Station appears to have included a variety of lead containing paints. In order to comply with existing workplace health and safety regulations regarding potential exposure to hazardous materials, appropriate containment/ encapsulation or abatement measures will be required to ensure the safety of any persons in the building, or in the event of any site renovations requiring demolition works (e.g., paint stripping) which could potentially release these hazardous materials into the air as a dust-type material. The analytical results are expected to be consistent throughout the station for paints of similar types and colours (i.e., all blue paint on piping present within the station would be considered to contain lead in excess of the assessment EQGs).

If the painted equipment and surfaces are to be left in place during the course of the proposed facility upgrades, appropriate containment measures will be required for the lead containing paint to minimize the potential for direct contact or damage to the materials which could result in the release of dust-type particulates. For general purposes, the repainting of the intact surfaces with lead free paint would be sufficient for encapsulation. If the existing paint is to be removed/ stripped through either use of solvents or mechanical action (e.g., sand blasting) prior to repainting/ recoating of any materials remaining in place, or if the paint is expected to be disturbed during painted joint disconnection, etc., an appropriate abatement program will be required to ensure the safe removal of this material in accordance with Provincial Health and Safety regulations, the proper containment of these materials, and their proper classification and disposal at approved waste disposal/ treatment facilities, in accordance with Provincial industrial or hazardous waste regulations. Based on the TCLP analytical results, all paint stripping residue should also be considered as hazardous waste, and so handled and disposed of accordingly at an appropriate hazardous waste management site.

Based on the apparent absence of asbestos containing materials present, an asbestos management plan is not required.

REFERENCES

National Institute for Occupational Safety and Health. (1994). *ASBESTOS and OTHER FIBERS by PCM: METHOD 7400, Issue 2.*

Government of Canada. (2010; 2016). *Canada Consumer Products Safety Act, Consumer Products Containing Lead (Contact with Mouth) Regulations SOR/2010-273.*

Government of Canada. (2010; 2016). *Canada Consumer Products Safety Act, Surface Coating Materials Regulations SOR/2016-193.*

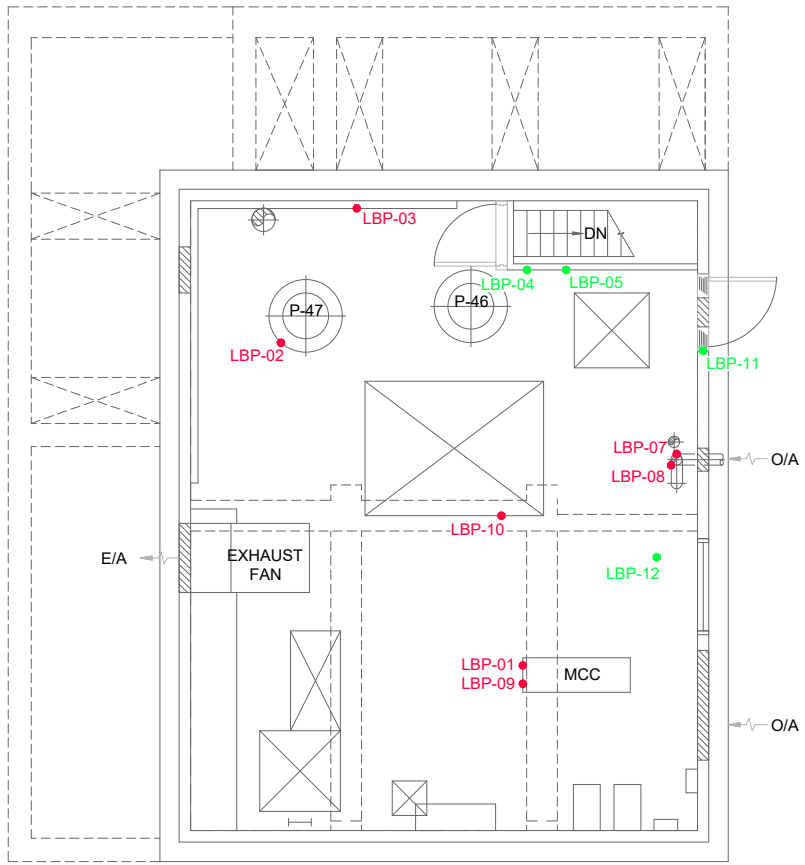
Government of Manitoba. (2016). *Manitoba Workplace Safety and Health Act and Regulation.*

Government of Manitoba. (2015). *The Dangerous Goods Handling and Transportation Act (C.C.S.M. c. D12) Hazardous Waste Regulation.*

Safe Work Manitoba, 2017. *Guide for Asbestos Management.*

APPENDIX A

FIGURES



1 - -

MAIN FLOOR PLAN

1 : 100

LEGEND:

RED ANALYTICAL ABOVE GUIDELINES

GREEN ANALYTICAL BELOW GUIDELINES

REFERENCE DRAWINGS:

1:100

1 0 1 2 3 4 5m

APPROXIMATE SCALE

NO.	DATE	DESCRIPTION	ISSUED BY

REVISIONS/ISSUE

TETRA TECH

AUTHORIZED BY: BH

DATE: -

CLIENT DRAWING NO.

CLIENT

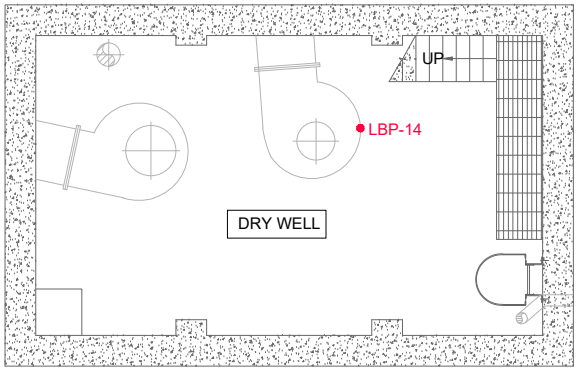
CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

DRAWING DESCRIPTION

FIGURE 1: LINDEN FLOOD PUMPING STATION UPGRADES
HAZARDOUS MATERIALS SAMPLE ANALYTICAL RESULTS
(PASS/FAIL)

DESIGNED BY:	MR	DRAWN BY:	BM	DRAWING NO.	REV.
REVIEWED BY:	MR	SCALE:	1:100	2100120600-SKT-V0001	00

AL (11" x 8.5")



1 - FLOOD STATION - PLAN AT DRY WELL INTERMEDIATE PLATFORM
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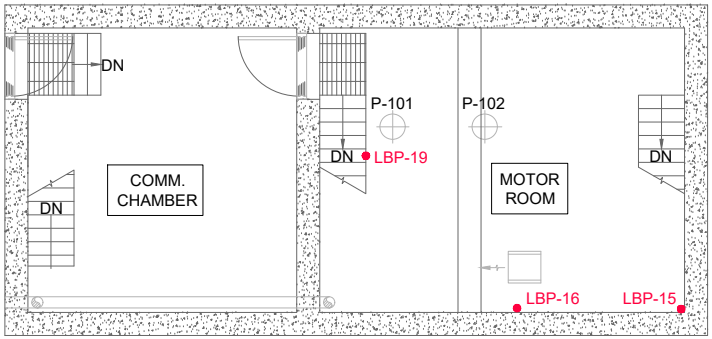
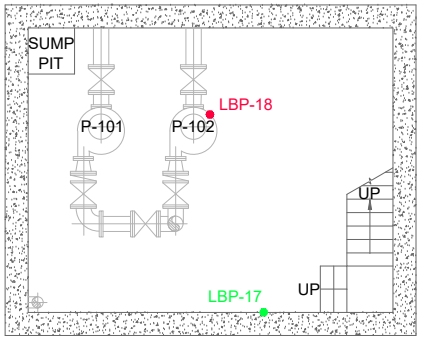


2 - LIFT STATION - PLAN AT MOTOR ROOM
1 : 100



3 - LIFT STATION - PLAN AT PUMP CHAMBER
1 : 100

LEGEND:
RED ANALYTICAL ABOVE GUIDELINES
GREEN ANALYTICAL BELOW GUIDELINES

REFERENCE DRAWINGS:

1:100

1 0 1 2 3 4 5m
APPROXIMATE SCALE

NO.	DATE	DESCRIPTION	ISSUED BY

REVISIONS/ISSUE

TETRA TECH

AUTHORIZED BY: BH
DATE: -
CLIENT DRAWING NO.

CLIENT
CITY OF WINNIPEG
WATER AND WASTE DEPARTMENT

DRAWING DESCRIPTION
FIGURE 2: LINDEN FLOOD PUMPING STATION UPGRADES
HAZARDOUS MATERIALS SAMPLE ANALYTICAL RESULTS
(PASS/FAIL)

DESIGNED BY:	MR	DRAWN BY:	BM	DRAWING NO.	REV.
REVIEWED BY:	MR	SCALE:	1:100	2100120600-DWG-V0002	00

AL (11" x 8.5")

APPENDIX B

SITE PHOTOGRAPHS

Photo 1: General view of electrical components on the main floor. (April 27, 2021)

Photo 2: General view of paint chip sample LBP-01 location on electrical components on the main floor. (April 27, 2021)

Photo 3: General view of the top drive unit for the centrifugal pump P-47. (April 27, 2021)

Photo 4: General view of the paint chip sample LBP-02 location on the top drive unit for centrifugal pump P-47. (April 27, 2021)

Photo 5: General view of the plywood backing board for the electrical panel on the north wall of the main floor. (April 27, 2021)

Photo 6: General view of paint chip sample LBP-03 location on the plywood backing board for the electrical panel on the main floor. (April 27, 2021)

Photo 7: General view of the vestibule for the access stairs and an attached cupboard on the north wall of the main floor. (April 27, 2021)

Photo 8: General view of the paint chip sample LBP-04 location on the vestibule on the northeast side of the main floor. (April 27, 2021)

Photo 9: General view of the paint chip sample LBP-05 location on the cupboard on the northeast side of the main floor. (April 27, 2021)

Photo 10: General view of the blower and associated piping near the northeast corner of the main floor. (April 27, 2021)

Photo 11: General view of the paint chip sample LBP-07 location on the piping for the blower near the northeast corner of the main floor. (April 27, 2021)

Photo 12: General view of the blower and associated stand on the northeast corner of the main floor. (April 27, 2021)

Photo 13: General view of paint chip sample location LBP-08 on the stand for the blower near the northeast corner of the main floor. (April 27, 2021)

Photo 14: General view of the conduit connecting electrical components on the main floor. (April 27, 2021)

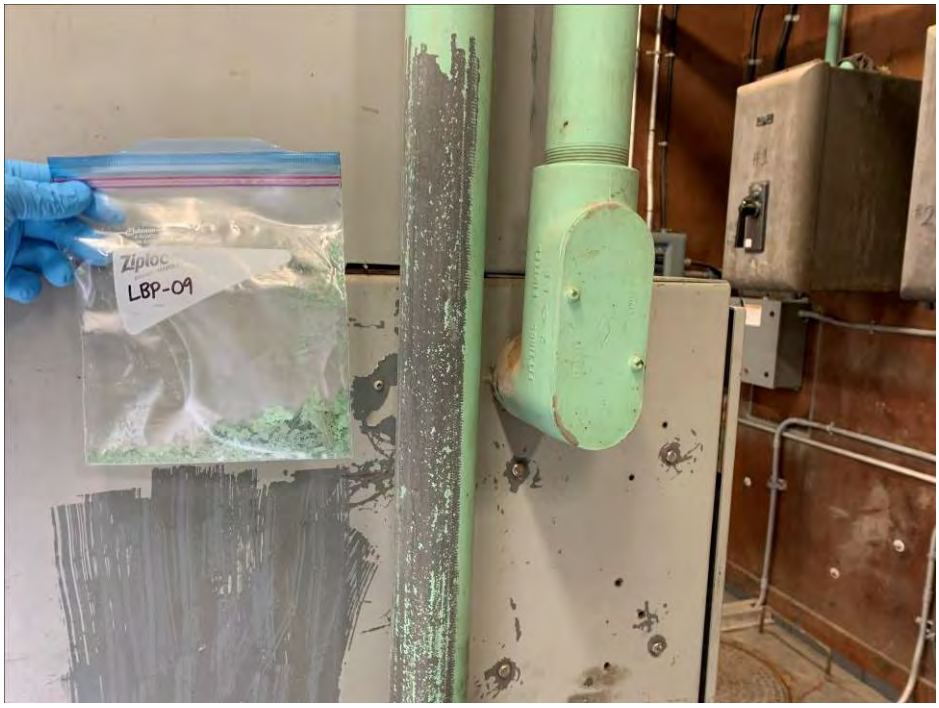


Photo 15: General view of the paint chip sample LBP-01 location on the conduit for the electrical components on the main floor. (April 27, 2021)

Photo 16: General view of the guard rail near the center of the main floor. (April 27, 2021)

Photo 17: General view of paint chip sample LBP-10 location on the guard rail near the center of the main floor. (April 27, 2021)

Photo 18: General view of the access door and frame at the northwest corner of the main floor. (April 27, 2021)

Photo 19: General view of paint chip sample LBP-11 location on the door frame at the northeast corner of the main floor. (April 27, 2021)

Photo 20: General view of the flooring of the main floor. (April 27, 2021)

Photo 21: General view of the paint chip sample LBP-12 location on the main floor. (March 15, 2018)

Photo 22: General view of the centrifugal pump P-46 in the dry well. (April 27, 2021)

Photo 23: General view of the paint chip sample LBP-14 location on centrifugal pump P-46 in the dry well. (April 27, 2021)

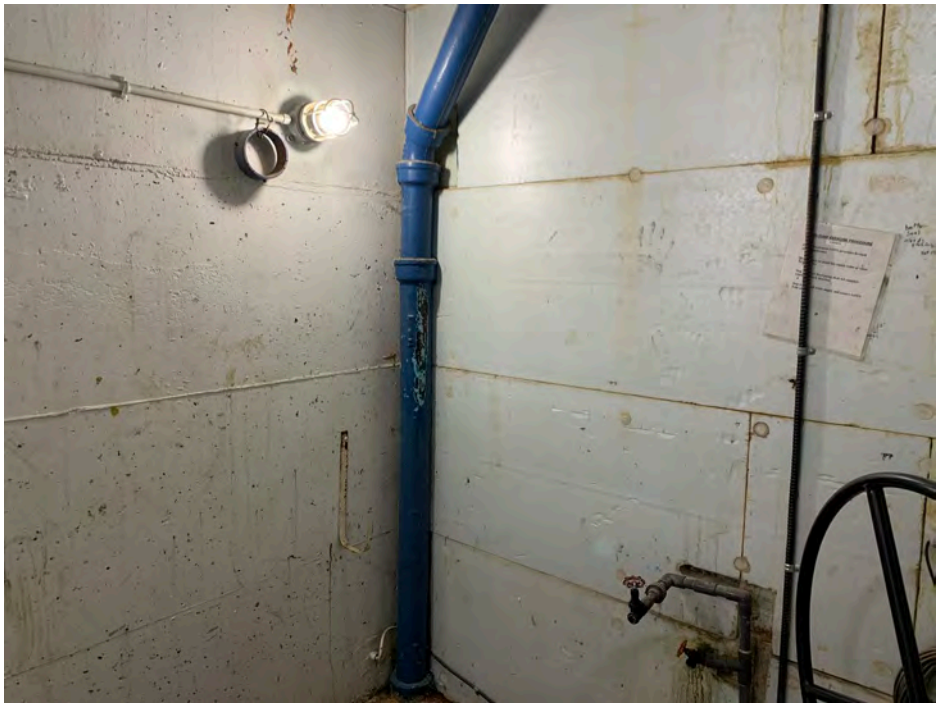


Photo 24: General view of piping in the motor room. (April 27, 2021)

Photo 25: General view of the paint chip sample LBP-15 location on the piping in the motor room. (April 27, 2021)

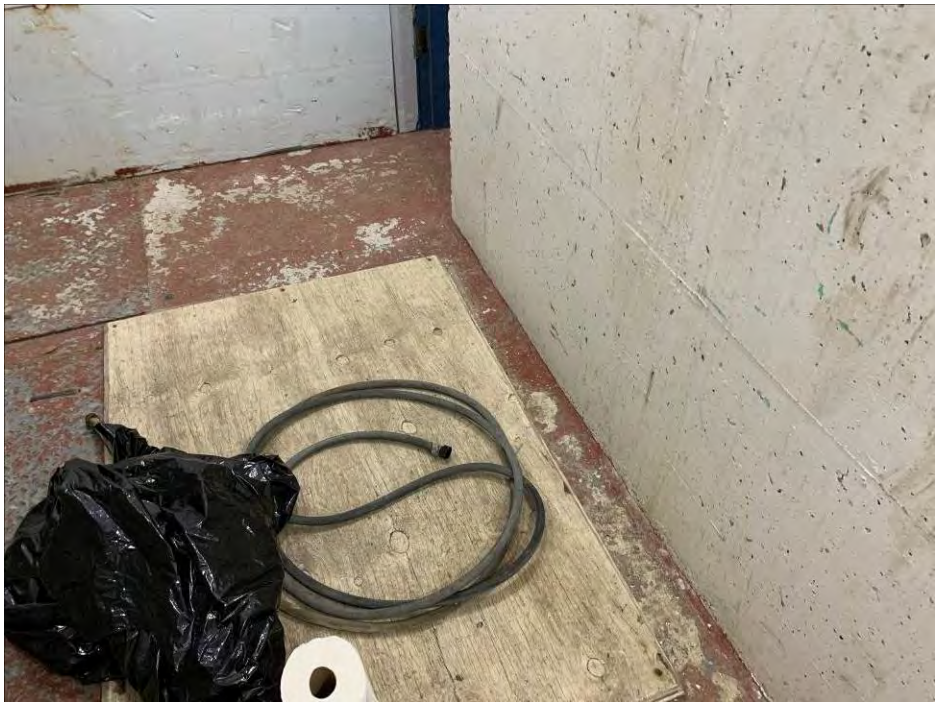


Photo 26: General view of the flooring in the motor room. (April 27, 2021)

Photo 27: General view of the paint chip sample LBP-16 location on the floor in the motor room. (April 27, 2021)

Photo 28: General view of the painted walls in the pump chamber. (March 15, 2018)

Photo 29: General view of the paint chip sample LBP-17 location on the wall of the pump chamber. (April 27, 2021)

Photo 30: General view of the pumps in the pump chamber. (April 27, 2021)

Photo 31: General view of the paint chip sample location LBP-18 location on a pump in the pump chamber. (April 27, 2021)

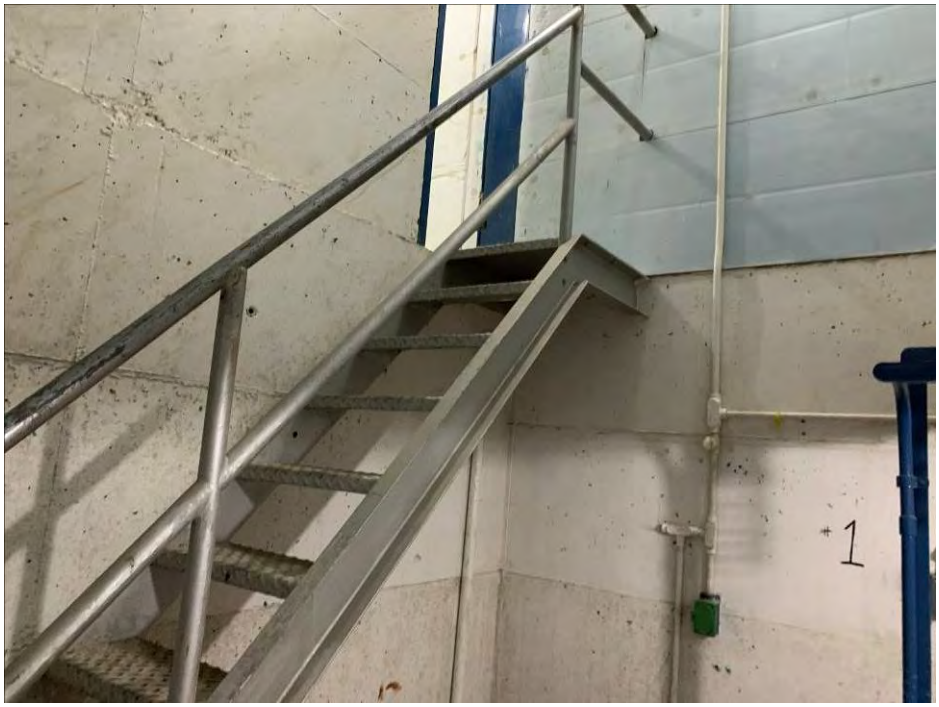


Photo 32: General view of the access stairs and railing in the motor room. (April 27, 2021)

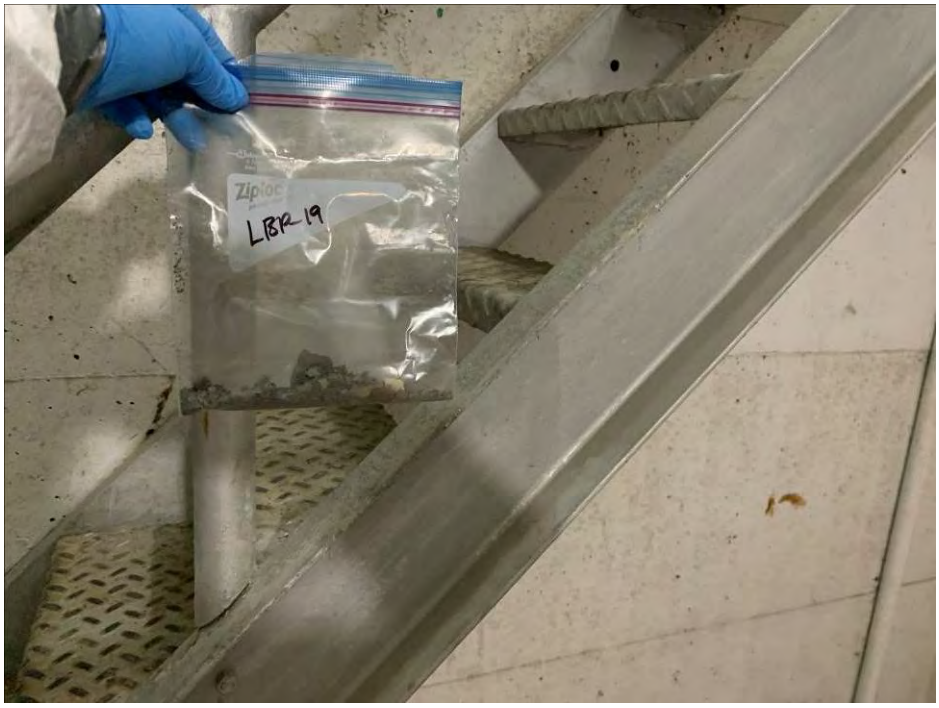


Photo 33: General view of the paint chip sample LBP-19 location on the access stairs in the motor room. (April 27, 2021)

APPENDIX C

HISTORICAL HAZARDOUS MATERIALS ASSESSMENT

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

ALL DATA REPORT

PINCHIN
1.855.PINCHIN www.pinchin.com

Client: City of Winnipeg Water and Waste Dept **Site: Lift Stations** **Building Name: 44 : Linden Combined Lift/Flood Station**

Location: #1 : Motor/Control Room **Floor: Main** **Room #:** **Area (sqft): 0**

Survey Date: **Last Re-Assessment:**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling	Not Found	None Found													
Duct	Supply Air	Foil Face	Joint		B										
Duct	Supply Air	Not Insulated													
Floor		Steel													
Floor		Concrete (poured)													
Floor		Wood													
Mechanical Equipment	Motor	Not Insulated		Paint											
Piping	All	Not Insulated		Paint											
Structure	All	Wood													
Wall		Concrete (poured)													
Wall		Wood													

No visual inspection or sampling was conducted at the exterior and roof. Exterior and roof sections needs to be tested prior to any renovation or demolition activities.

Client: City of Winnipeg Water and Waste Dept **Site: Lift Stations** **Building Name: 44 : Linden Combined Lift/Flood Station**

Location: #2 : Flood Station Side Pump Room **Floor: Basement Level 1** **Room #:** **Area (sqft): 0**

Survey Date: **Last Re-Assessment:**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling	All	Styrofoam													
Duct	Supply Air	Not Insulated													
Floor	All	Concrete (poured)													
Mechanical Equipment	Motor	Not Insulated		Paint											
Piping	All	Not Insulated													
Structure	Column	Concrete (poured)													
Wall		Concrete (poured)													
Wall		Styrofoam													

Client: City of Winnipeg Water and Waste Dept **Site: Lift Stations** **Building Name: 44 : Linden Combined Lift/Flood Station**

Location: #3 : Gate Valve Room **Floor: Basement Level 3** **Room #:** **Area (sqft): 0**

Survey Date: **Last Re-Assessment:**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling	All	Styrofoam													
Duct	Supply Air	Not Insulated		Paint											
Floor		Steel													
Floor		Concrete (poured)													
Floor		Wood													
Mechanical Equipment	Not Found	None Found													
Piping	All	Not Insulated		Paint											
Structure	All	Concrete (poured)													
Wall		Concrete (poured)													
Wall		Styrofoam													

Client: City of Winnipeg Water and Waste Dept **Site: Lift Stations** **Building Name: 44 : Linden Combined Lift/Flood Station**

Location: #4 : Lift Motor Room **Floor: Basement Level 2** **Room #:** **Area (sqft): 0**

Survey Date: **Last Re-Assessment:**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Concrete (poured)													
Ceiling		Styrofoam													
Duct	Supply Air	Not Insulated		Paint											
Floor		Concrete (poured)													
Floor		Wood													
Mechanical Equipment	Motor	Not Insulated		Paint											
Piping	All	Not Insulated		Paint											
Structure	Not Found	None Found													
Wall		Concrete (poured)													
Wall		Styrofoam													

Client: City of Winnipeg Water and Waste Dept **Site: Lift Stations** **Building Name: 44 : Linden Combined Lift/Flood Station**

Location: #5 : Lift Station Side Pump Room **Floor: Basement Level 1** **Room #:** **Area (sqft): 0**

Survey Date: **Last Re-Assessment:**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling	All	Concrete (poured)													
Duct	Supply Air	Not Insulated		Paint											
Floor	All	Concrete (poured)													
Mechanical Equipment	Motor	Not Insulated		Paint											
Piping	All	Not Insulated		Paint											
Structure	Column	Concrete (poured)													
Wall	All	Concrete (poured)													

Legend:

Sample number	
S####	Asbestos sample collected
V####	Material visually similar to numbered sample collected
V0000	Known non-asbestos material
V9000	Visually identified as an asbestos material
V9500	Material is presumed to be an asbestos material

Units	
SF	Square feet
LF	Linear feet
EA	Each
%	Percentage

Other	
A	Access
V	Visible
AP	Air Plenum
F	Friable material
NF	Non Friable material
PF	Potentially Friable material

Access	
A	Accessible to all building occupants
B	Accessible to maintenance and operations staff without a ladder
C	Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas
D	Not normally accessible

Condition	
Good	No visible damage or deterioration
Fair	Minor, repairable damage, cracking, delamination or deterioration
Poor	Irreparable damage or deterioration with exposed and missing material

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

ASBESTOS SUMMARY REPORT

PINCHIN
1.855.PINCHIN www.pinchin.com

Client:City of Winnipeg Water and Waste Dept
Site: , , MB **Building Name: Linden Combined Lift/Flood Station**
Surveyor: LSC **Survey Date: 2009-09-11** **Reassessment Surveyor:** **Last Re-Assessment:**

System	Asbestos	Friable	ACM Materials	Locations where ACM materials are present - Location(Room Number)	Recommended Actions	Quantity
C - Ceiling	No	No				
		Yes				
D - Duct	No	No				
		Yes				
F - Floor	No	No				
		Yes				
M - Mechanical Equipment	No	No				
		Yes				
P - Piping	No	No				
		Yes				
S - Structure	No	No				
		Yes				
W - Wall	No	No				
		Yes				

Action

(1)	**Clean up of ACM Debris**	**(2)**	**Precautions for Access Which may Disturb ACM Debris**	**(3)**	**ACM removal**
(4)	**Precautions for Work Which may Disturb ACM in Poor Condition**	**(5)**	**Proactive ACM removal (Minimum repair required for fair condition)**	**(6)**	**ACM repair**
(7)	**Management program and surveillance**				

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

HAZARDOUS MATERIALS SUMMARY / SAMPLE LOG

PINCHIN
1.855.PINCHIN www.pinchin.com

Client:City of Winnipeg Water and Waste Dept **Site: , , MB** **Building Name: Linden Combined Lift/Flood Station** **Surveyor: LSC** **Survey Date: 2009-09-11**

HAZMAT	Sample No	System/Material/Sample Description	Locations	LF	SF	EA	%	Type	Positive

Legend:

Sample number	
S####	Asbestos sample collected
L####	Paint sample collected
P####	PCB sample collected
M####	Mould sample collected
V####	Material visually similar to numbered sample collected
V0000	Known non Hazardous Material
V9000	Material is visually identified as Hazardous Material
V9500	Material is presumed to be Hazardous Material

Units	
SF	Square feet
LF	Linear feet
EA	Each
%	Percentage

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

LOCATIONS LIST

PINCHIN
1.855.PINCHIN www.pinchin.com

Client:City of Winnipeg Water and Waste Dept **Site: , , MB**
Building Name: Linden Combined Lift/Flood Station
Surveyor: LSC **Survey Date: 2009-09-11**
Reassessment Surveyor: **Last Re-Assessment:**

Location No.	Name or Description	ft^2	Floor No.	Notes
1	Motor/Control Room	0	Main	No visual inspection or sampling was conducted at the exterior and roof. Exterior and roof sections needs to be tested prior to any renovation or demolition activities.
2	Flood Station Side Pump Room	0	Basement Level 1	
3	Gate Valve Room	0	Basement Level 3	
4	Lift Motor Room	0	Basement Level 2	
5	Lift Station Side Pump Room	0	Basement Level 1	

Quantities shown above are based on visual approximations only and may be subject to variation.

APPENDIX D

TABLES

Table 1

Paint Chip Sample Laboratory Analytical Results
Hazardous Building Materials Assessment
City of Winnipeg Linden Lift and Flood Pumping Station, Winnipeg, Manitoba

Sample ID	Date Sampled	Material Description	General Condition	Paint Chip Samples	
				Lead (mg/kg)	Mercury (mg/kg)
LBP-01	27-Apr-21	Grey paint - on electrical components on main floor	Fair - some flaking (Photo 2)	***4130***	4.13
LBP-02	27-Apr-21	Grey over brown paint - top drive for pump P-47 on main floor	Fair - some paint flaking due to corrosion at joints. (Photo 4)	***1710***	0.231
LBP-03	27-Apr-21	Grey paint - on plywood backing for electrical panels on the main floor	Good (Photo 6)	***5220***	2.29
LBP-04	27-Apr-21	Green paint - on plywood vestibule for stairwell on the main floor	Good (Photo 8)	18.9	0.623
LBP-05	27-Apr-21	White paint - on plywood for cabinet attached to green plywood vestibule on the main floor	Good (Photo 9)	7.7	<0.050
LBP-07	27-Apr-21	Grey over blue paint - on blower pipe near entrance door on main floor	Poor - flaking and chipping (Photo 11)	***260***	6.61
LBP-08	27-Apr-21	Black paint - on blower stand near entrance on the main floor	Poor - flaking and chipping (Photo 13)	***337***	3.05
LBP-09	27-Apr-21	Green paint - on conduit pipe connecting electrical components on the main floor	Good (Photo 15)	***2150***	***763***
LBP-10	27-Apr-21	Blue paint - railing on the main floor	Fair - some chipping and worn (Photo 17)	***944***	5.18
LBP-11	27-Apr-21	Brown paint - door frame around entrance near on the main floor	Fair - some chipping (Photo 19)	10.5	0.142
LBP-12	27-Apr-21	Grey paint - concrete floor of the main floor	Fair - worn (Photo 21)	11.9	0.187
LBP-14	27-Apr-21	Silver over orange paint - on pump P-46 in the dry well	Poor - extensive chipping and flaking (Photo 23)	***112000***	4.90
LBP-15	27-Apr-21	Blue paint - on piping in the motor room	Fair - some chipping and physical damage (Photo 25)	***1530***	4.55
LBP-16	27-Apr-21	Red over grey paint - on flooring in the motor room	Poor - extensive chipping, flaking, and physical damage (Photo 27)	***2693***	4.45
LBP-17	27-Apr-21	White over blue paint - on the walls of the pump chamber	Poor - extensive chipping and flaking (Photo 29)	30.3	1.12
LBP-18	27-Apr-21	Blue over red over teal paint - on pumps in the pump chamber	Poor - extensive chipping, flaking, and physical damage (Photo 31)	***931***	1.52
LBP-19	27-Apr-21	Silver paint - on stairs throughout the station	Fair - some flaking and physical damage (Photo 33)	***380***	5.89
Referenced Environmental Quality Guideline				90[a]	10[a]

Notes: Analytical exceedances shown in ***bold*** text.
[a] Government of Canada, 2010; 2016. *Canada Consumer Products Safety Act*, *Consumer Products Containing Lead (Contact with Mouth) Regulations SOR/2010-273*; *Surface Coating Materials Regulations SOR/2016-193*.

Table 2

Paint Chip Sample Toxicity Characteristic Leaching Procedure Laboratory Analytical Results
Hazardous Building Materials Assessment
City of Winnipeg Linden Lift and Flood Pumping Station, Winnipeg, Manitoba

Sample ID	Date Sampled	Material Description	General Condition	Paint Chip Samples	
				Lead (mg/L)	Mercury (mg/L)
LBP-14	27-Apr-21	Silver over orange paint - on pump P-46 in the dry well	Poor - extensive chipping and flaking (Photo 23)	***76.4***	<0.00010
Referenced Environmental Quality Guideline				5[a]	0.1[a]

Notes: Analytical exceedances shown in ***bold*** text.
[a] Government of Manitoba, 2015. *The Dangerous Goods Handling and Transportation Act (C.C.S.M. c. D12) Hazardous Waste Regulation.*

APPENDIX E

LABORATORY ANALYTICAL RESULTS

Tetra Tech Canada Inc.
ATTN: BRENT HORNING
400-161 Portage Ave East
Winnipeg MB R3B 0Y4

Date Received: 28-APR-21
Report Date: 17-MAY-21 15:50 (MT)
Version: FINAL REV. 2

Client Phone: 204-981-5317

Certificate of Analysis

Lab Work Order #: L2581225

Project P.O. #: NOT SUBMITTED
Job Reference: 734-2100120600
C of C Numbers:
Legal Site Desc: LINDEN LFPS

Comments: ADDITIONAL 12-MAY-21 09:56

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2581225-1 LBP-01							
Sampled By: CLIENT on 27-APR-21 @ 08:40							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	4.13		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	4130		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-2 LBP-02							
Sampled By: CLIENT on 27-APR-21 @ 08:50							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	0.231		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	1710		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-3 LBP-03							
Sampled By: CLIENT on 27-APR-21 @ 09:00							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	2.29		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	5220		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-4 LBP-04							
Sampled By: CLIENT on 27-APR-21 @ 09:10							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	0.623		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	18.9		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-5 LBP-05							
Sampled By: CLIENT on 27-APR-21 @ 09:20							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	<0.050		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	7.7		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-6 LBP-07							
Sampled By: CLIENT on 27-APR-21 @ 09:40							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	6.61	DLHC	0.50	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	260		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-7 LBP-08							
Sampled By: CLIENT on 27-APR-21 @ 09:50							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	3.05		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	337		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-8 LBP-09							
Sampled By: CLIENT on 27-APR-21 @ 10:00							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	763	DLHC	50	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	2150		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-9 LBP-10							
Sampled By: CLIENT on 27-APR-21 @ 10:10							
Matrix: PAINT							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2581225-9 LBP-10							
Sampled By: CLIENT on 27-APR-21 @ 10:10							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	5.18	DLHC	0.50	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	944		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-10 LBP-11							
Sampled By: CLIENT on 27-APR-21 @ 10:20							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	0.142		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	10.5		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-11 LBP-12							
Sampled By: CLIENT on 27-APR-21 @ 10:30							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	0.187		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	11.9		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-12 LBP-14							
Sampled By: CLIENT on 27-APR-21 @ 10:50							
Matrix: PAINT							
Miscellaneous Parameters							
Lead (Pb)	76.4	DLHC	0.25	mg/L		17-MAY-21	R5458421
Mercury (Hg)	<0.00010		0.00010	mg/L		14-MAY-21	R5457715
Mercury (Hg)	4.90		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	112000	DLHC	20	ug/g	03-MAY-21	04-MAY-21	R5452602
Leachate Procedure for Reg 347							
Initial pH	6.30	LTIS	0.10	pH units		14-MAY-21	R5457472
Final pH	5.01	LTIS	0.10	pH units		14-MAY-21	R5457472
L2581225-13 LBP-15							
Sampled By: CLIENT on 27-APR-21 @ 11:00							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	4.55		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	1530		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-14 LBP-16							
Sampled By: CLIENT on 27-APR-21 @ 11:10							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	4.45		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	2690		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-15 LBP-17							
Sampled By: CLIENT on 27-APR-21 @ 11:20							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	1.12		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	30.3		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-16 LBP-18							
Sampled By: CLIENT on 27-APR-21 @ 11:30							
Matrix: PAINT							
Miscellaneous Parameters							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2581225-16 LBP-18							
Sampled By: CLIENT on 27-APR-21 @ 11:30							
Matrix: PAINT							
Mercury (Hg)	1.52		0.050	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	931		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602
L2581225-17 LBP-19							
Sampled By: CLIENT on 27-APR-21 @ 11:40							
Matrix: PAINT							
Miscellaneous Parameters							
Mercury (Hg)	5.89	DLHC	0.50	mg/kg	03-MAY-21	04-MAY-21	R5447923
Lead (Pb)	380		1.0	ug/g	03-MAY-21	04-MAY-21	R5452602

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
LTIS	Limited sample was available for TCLP or SPLP inorganics & semi-volatiles extraction (<100 grams). Extraction fluid volume &/or other elements of the method were scaled down proportionately to permit analysis. Test results from modified leach procedures may be unsuitable for regulatory purposes.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
HG-PAINT-WT	Misc.	Mercury by CVAA in Paint Chips	SW846 7470A
HG-TCLP-WT	Waste	Mercury (CVAA) for O.Reg 347	EPA 1631E
		This analysis is carried out in accordance with the extraction procedure outlined in "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods Volume 1C" SW-846 EPA Method 1311, published by the United States Environmental Protection Agency (EPA). In summary, the sample is extracted at a 20:1 liquid to solids ratio for 16 to 20 hours using either extraction fluid #1 (glacial acetic acid, water and sodium hydroxide) or extraction fluid #2 (glacial acetic acid), depending on the pH of the original sample. The extract is then filtered through a 0.6 to 0.8 micron glass fibre filter and analysed using atomic absorption spectrophotometry (EPA 1631E).	
LEACH-TCLP-WT	Waste	Leachate Procedure for Reg 347	EPA 1311
		Inorganic and Semi-Volatile Organic contaminants are leached from waste samples in strict accordance with US EPA Method 1311, "Toxicity Characteristic Leaching Procedure" (TCLP). Test results are reported in leachate concentration units (normally mg/L).	
MET-200.2-CCMS-WT	Misc.	Metals in Paint and Miscellaneous	EPA 200.2/EPA6020A(mod)
		Paint samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.	
PB-TCLP-WT	Waste	Lead for O. Reg 347	EPA 200.8

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2581225 Report Date: 17-MAY-21

Client: Tetra Tech Canada Inc.
400-161 Portage Ave East
Winnipeg MB R3B 0Y4
Contact: BRENT HORNING

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-PAINT-WT	**Misc.**							
Batch R5447923								
WG3528320-3 LCS		**STD**						
Mercury (Hg)			104.0		%		70-130	04-MAY-21
WG3528320-1 MB								
Mercury (Hg)			<0.050		mg/kg		0.05	04-MAY-21
MET-200.2-CCMS-WT	**Misc.**							
Batch R5452602								
WG3528320-2 CRM		**WT-SS-2**						
Lead (Pb)			110.8		%		70-130	04-MAY-21
WG3528320-4 LCS		**1+2**						
Lead (Pb)			94.5		%		70-130	04-MAY-21
WG3528320-1 MB								
Lead (Pb)			<1.0		mg/kg		1	04-MAY-21
HG-TCLP-WT	**Waste**							
Batch R5457715								
WG3534785-2 LCS								
Mercury (Hg)			109.0		%		70-130	14-MAY-21
WG3534785-1 MB								
Mercury (Hg)			<0.00010		mg/L		0.0001	14-MAY-21
PB-TCLP-WT	**Waste**							
Batch R5458421								
WG3534819-2 LCS								
Lead (Pb)			104.3		%		70-130	14-MAY-21
WG3534819-1 MB								
Lead (Pb)			<0.025		mg/L		0.025	14-MAY-21

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes 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 pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

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L2581225-COFC

COC Number: 21 -

Page 1 of 2

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech Canada Inc.
Contact:	Brent Horning
Phone:	204-981-5317
	Company address below will appear on the final report
Street:	400-161 Portage Ave E
City/Province:	Winnipeg, MB
Postal Code:	R3B 0Y4
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax brent.horning@tetratech.com
Email 2 labresultsmb@tetratech.com
Email 3 matt.randell@tetratech.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax brent.horning@tetratech.com
Email 2 labresultsmb@tetratech.com

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #:	
Job #:	734-2100120600
PO / AFE:	
LSD:	Linden LFPS

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: JD Sampler: MR

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Mercury in paint	Lead in paint	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRE	SUSPECTED HAZARD (see notes)
1	LBP-01	27-Apr-21	8:40	Paint	1	R	R			
2	LBP-02	27-Apr-21	8:50	Paint	1	R	R			
3	LBP-03	27-Apr-21	9:00	Paint	1	R	R			
4	LBP-04	27-Apr-21	9:10	Paint	1	R	R			
5	LBP-05	27-Apr-21	9:20	Paint	1	R	R			
~~6~~	~~LBP-06~~	~~27-Apr-21~~	~~9:30~~	~~Paint~~	~~1~~	~~R~~	~~R~~			
6	LBP-07	27-Apr-21	9:40	Paint	1	R	R			
7	LBP-08	27-Apr-21	9:50	Paint	1	R	R			
8	LBP-09	27-Apr-21	10:00	Paint	1	R	R			
9	LBP-10	27-Apr-21	10:10	Paint	1	R	R			
10	LBP-11	27-Apr-21	10:20	Paint	1	R	R			
11	LBP-12	27-Apr-21	10:30	Paint	1	R	R			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human consumption/ use? ☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Upon receiving sample results, a request will be submitted for select samples to be analyzed for TCLP.

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
							14.3

SHIPMENT RELEASE (client use)

Released by: Matthew Randell	Date: 27-Apr-21	Time: 16:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date: APR 28 2021	Time: 9:30

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date: APR 28 2021	Time: 9:30

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AUG 2020 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

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L2581225-COFC

Chain of Custody (COC) Form

COC Number: 21 -

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech Canada Inc.
Contact:	Brent Horning
Phone:	204-981-5317
	Company address below will appear on the final report
Street:	400-161 Portage Ave E
City/Province:	Winnipeg, MB
Postal Code:	R3B 0Y4
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: brent.horning@tetratech.com
Email 2: labresultsmb@tetratech.com
Email 3: matt.randell@tetratech.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: brent.horning@tetratech.com
Email 2: labresultsmb@tetratech.com

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
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PO / AFE:	
LSD:	Linden LFPS

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Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: JD Sampler: MR

Analysis Request

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ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Mercury in paint	Lead in paint	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
~~-~~	~~LBP-13~~	~~27-Apr-21~~	~~10:40~~	~~Paint~~	~~1~~	~~R~~	~~R~~			
12	LBP-14	27-Apr-21	10:50	Paint	1	R	R			
13	LBP-15	27-Apr-21	11:00	Paint	1	R	R			
14	LBP-16	27-Apr-21	11:10	Paint	1	R	R			
15	LBP-17	27-Apr-21	11:20	Paint	1	R	R			
16	LBP-18	27-Apr-21	11:30	Paint	1	R	R			
17	LBP-19	27-Apr-21	11:40	Paint	1	R	R			

Drinking Water (DW) Samples[1] (client use)

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Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
	14.3

SHIPMENT RELEASE (client use)

Released by: Matthew Randell MR | Date: 27-Apr-21 | Time: 16:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: | Date: APR 28 2021 | Time: 930

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: | Date: APR 28 2021 | Time: 930

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.