



**Forestry Farm Park Zoo
1903 Forestry Farm Park Drive, Saskatoon, SK
Asbestos Survey Report**



September 2016

Prepared for: City of Saskatoon
222 3rd Avenue North
Saskatoon, SK S7K 0J5

Prepared by: Bersch & Associates Ltd.
244 – 2002 Quebec Avenue
Saskatoon, SK S7K 1W4

Project No. B67SRI14F

1.0 EXECUTIVE SUMMARY

The survey of the Forestry Farm Park and Zoo at 1903 Forestry Farm Park Drive in Saskatoon, Saskatchewan entailed the inspection of all accessible suspected Asbestos Containing Material (ACM) located throughout the facilities. Materials inspected included mechanical insulating material, ceiling tile, drywall mud compound, vinyl floor covering, etc.

Bulk sample analysis results indicate the presence of “Chrysotile Asbestos” and “Actinolite/Tremolite Asbestos” within the Forestry Park and Zoo located in Saskatoon, SK. The buildings are ranging from the early 1900’s to the 2000’s with most of them being renovated. The recommended action to be implemented in reference to the ACM identified is “Management”. Refer to **Section 5.0 Asbestos Abatement Discussion** for further details. It should be noted that the recommendation of “Management” as part of the asbestos action plan is based on the premise that renovations are not scheduled throughout the facility that would impact the asbestos containing material present. Asbestos was detected in the following forms and locations throughout the facility:

- **Spray-Applied Insulation** is located in the Attic of the Wolf Shelter and the Basement of the Auditorium. Please refer to *Appendix I & II* of this report.
- **Vermiculite (Block Wall Insulation)** was observed during the survey in the Old Maintenance Building and is also found within the Maintenance Building. Please refer to *Appendix I & II* of this report.

Bersch & Associates Ltd. implements the use of doorjamb labels that are applied to all doorjamb of rooms containing asbestos. This permits anyone accessing the room to easily identify the ACM present without having to reference the written report. Legends providing explanation of the abbreviations used on doorjamb were placed on the backside of all maintenance/custodial doors within the facility. Employees and contractors must be informed of the presence of asbestos and the use of the legend as a reference to identify ACM within the areas they are working. The various types of accessible ACM within the facility have been clearly identified to eliminate uncertainty of asbestos content.

NOTE: All areas, which are inaccessible at this time, shall be considered to contain asbestos material until bulk sampling determines otherwise. Prior to any renovation/demolition activity, a destructive investigation is recommended to identify any inaccessible or concealed ACM. Materials such as the following may require more extensive destructive testing to determine the presence/absence of Asbestos:

- ***Block Wall Insulation (Vermiculite)*** – Potential locations for this type of insulation is within attics, walls and block wall cavities.
- ***Drywall Mud Compound*** - At joints and nail/screw holes on drywall.
- ***Vinyl Floor Covering*** – May be concealed below existing floor coverings.
- ***Pipefitting Compound*** – Found at T’s, hangers, and elbows.

During the survey of the Forestry Farm Zoo, the Asbestos Containing Materials were assessed and given a Priority Rating of One, Two or Three, with Priority One being the items requiring the most immediate attention. Refer to **Appendix II, Asbestos Survey Database** for a detailed room-by-room account of all areas inspected during survey activity. Refer to **Appendix III, Asbestos Containing Material Legend** for a detailed description of each of the abbreviations shown on the doorjamb labels.

2.0 INTRODUCTION

Bersch & Associates Ltd. was retained by the City of Saskatoon to conduct an inspection of the asbestos containing material at the Forestry Farm Zoo located in Saskatoon, SK. The purpose of the inspection was to identify any changes in conditions of remaining ACM and to update the current survey report.

This report gives a detailed account of the inspection results and our firm's recommendations on control options to be implemented to bring the Forestry Farm into compliance with the Province of Saskatchewan Occupational Health and Safety Act and Regulations. A review of this report shall be conducted with all trades that are entering the facility to perform maintenance or renovation activity. This will ensure they are familiar with the types and locations of asbestos-containing materials present and prevent any uncontrolled disturbance and/or possible exposure to asbestos.

3.0 METHODOLOGY

In September 2016 Bersch & Associates Ltd. conducted the survey of the Forestry Farm. The primary documents for guidance and criteria in this survey were the Province of Saskatchewan "Occupational Health and Safety Act and Regulations, 1996", Province of Saskatchewan, "Management of Asbestos", and the U.S. Environmental Protection Agency "Guidance for Controlling Asbestos Containing Materials in Buildings. The USEPA document identifies factors associated with the "condition" and the "potential for disturbance or erosion" of asbestos containing materials (ACM). These factors help to define potential for exposure of ACM and were used to make a qualitative evaluation of the material. It should be noted that the recommendation of a "Management" Asbestos Abatement Action is based upon the premise that renovations are not scheduled in that area that will require disturbing or violating the asbestos containing material. In the event that renovations are scheduled that impact upon the areas of asbestos containing material then pre-removal of the asbestos containing materials may be necessary.

In total, thirty-nine (39) bulk samples of the suspect asbestos containing materials were collected from Forestry Farm during the survey. “Chrysotile” was identified in five (5) samples and “Actinolite/Tremolite” was detected in one (1) sample. Refer to **Appendix I** for a copy of the **Bulk Sample Analysis Report**. All bulk samples collected were analyzed by Bersch & Associates Ltd. laboratory in accordance with the current USEPA 600/R-93/116 Method for the analysis of asbestos in building materials using polarized light microscopy and dispersion staining techniques the EPA 600/R-93/116 method for 0.1% target analytical sensitivity using analytical electron microscopy. The detection limit of these methods is listed as <1% by volume and greater than 0.1% amphibole asbestos, respectively.

4.0 RECOMMENDATIONS:

Throughout the survey of the Forestry Farm Zoo, the Asbestos Containing Materials were assessed and given a Priority Rating of One, Two or Three, with Priority One being the items requiring the most immediate attention. As a result, no Priority One items were identified. Priority Ratings for all other ACM identified is also found in the database on a room-by-room account. Future planning should begin to address these areas as per the recommendations provided in the attached **Asbestos Survey Database** found in *Appendix II*.

5.0 ASBESTOS ABATEMENT DISCUSSION

Asbestos is a known carcinogen and any release of asbestos fibres into the atmosphere creates a potential health hazard. Although the mechanism and epidemiology of asbestos carcinogenesis is not yet well defined, accumulating evidence suggests the significance of exposure at even very low fibre concentrations and hence human exposure should be kept to a minimum. It should be noted however that asbestos is a natural mineral and a measurable background concentration can be detected in any location sampled (inside buildings, outside buildings, urban, rural, etc.). The recommendations of the report are therefore intended to keep the potential exposure to an absolute minimum with the knowledge that a zero exposure is not possible.

Asbestos containing materials have been used in a wide variety of applications. Of particular concern, is the group known as friable products. A friable product is one that can be crumbled or reduced to powder or smaller fragments by hand pressure. Publications from the U.S.E.P.A. as early as 1977 have indicated the potential hazard of asbestos exposure in buildings containing these friable products. The two main uses of friable asbestos products are as spray insulation (thermal, acoustic or fireproofing) on deck and/or beams or as thermal insulation on piping or mechanical equipment. A large amount of non-friable asbestos containing materials have also been used in building construction such as asbestos cement board and asbestos containing vinyl flooring.

The mere presence of a friable asbestos containing material does not imply that there is an actual presence of elevated airborne fibre. As numerous studies have indicated, elevated asbestos fibre levels are generally found when settled dust or the actual asbestos containing material itself is disturbed by maintenance, renovation, inadvertent contact or vibration. The factors considered in the Environmental Protection Agency (USEPA) exposure assessment (condition of material, water damage, activity, movement, exposed surface area, accessibility, friability and presence in an air stream) often give some indication of the likelihood of fibre release but are not in any way definitive in determining whether a hazard exists or not. That is, even if the most friable product exists in a building, elevated fibre levels will not likely occur unless there is some disturbance by physical contact, vibration or an air stream. Asbestos containing pipe or mechanical insulation is not considered friable unless the jacketing is deteriorated or is disturbed by maintenance or renovation. There are four possible approaches to control exposure to airborne asbestos once a friable material is identified in a building. These methods briefly are as follows:

- A) Removal** - Asbestos material is removed and disposed of by burial and replaced by non-asbestos materials.
- B) Encapsulation** - Asbestos material is coated with a bridging or penetrating sealant.
- C) Enclosure** - Asbestos containing materials are separated from the building environment by physical airtight and waterproof barriers.
- D) Management and Custodial Control** - The Province of Saskatchewan Human Resources, Labor and Employment Branch under the Occupational health and Safety Regulations publish a document outlining “The Management of Asbestos”. In the guide for compliance, an action plan is outlined for management of the asbestos materials identified and in summary is:
 - 1. Identification. The Occupational Health & Safety Regulations state that all asbestos containing building materials be clearly marked “ASBESTOS” (where practical) to warn others of the possible exposure to asbestos fibres if disturbed.
 - 2. Inspection on regular basis is conducted to determine the ongoing condition of the material. As per the Occupational Health & Safety Regulations, 1996 an employer shall ensure that all friable asbestos containing material and all sprayed-on asbestos surfaces are regularly inspected by the employer, or owner and are inspected at least annually by a competent person to confirm that the material is not releasing, and is not likely to release, asbestos dust into the atmosphere. Maintenance staff should be instructed to bring to attention any problem areas they note during daily activities.

3. Development of Written Work Procedures for maintenance personnel to Control the Hazard of Asbestos or often arrangements are made for a qualified contractor to conduct the necessary removal/repair prior to the regular staff conducting maintenance. An Asbestos Control Plan needs to be developed that protects the health and safety of all workers in the event of the dispersal of asbestos dust into the atmosphere at a place of employment or worksite. A brief summary of the Asbestos Control Plan is found under Section 337 (2) of the Occupational Health and Safety Regulations, 1996.

4. Asbestos Abatement Awareness and Low Risk Process Training if the regular maintenance personnel are required to conduct asbestos related activities.

6.0 REFERENCES

- .1 Province of Saskatchewan "The Occupational Health and Safety Act and The Occupational Health and Safety Regulations" Office Consolidation, December 1996.
- .2 Province of Saskatchewan Human Resources, Labor, and Employment "The Management of Asbestos" January, 1991.
- .3 USEPA, U.S. Environmental Protection Agency, "Guidance for Controlling Asbestos-Containing Materials in Buildings". Washington, DC: Office of Toxic Substances, USEPA.
- .4 Midwest Centre for Occupational Health & Safety St. Paul's, Minnesota – Asbestos Inspectors & Management Planners
- .5 McCrone Research Institute Course Hayward California "Asbestos Identification"

APPENDIX I

BULK SAMPLE ANALYSIS REPORT

BERSCH & ASSOCIATES LTD.

September 21st, 2016

City of Saskatoon
222 3rd Avenue North
Saskatoon, SK
S7K 0J5

ATTENTION: Hazel Fernandez

SUBJECT: Bulk Sample Analysis Report – Forest Farm Park and Zoo

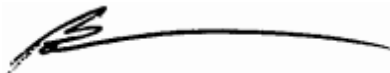
Please find attached the laboratory results for the bulk samples collected from the Forestry Farm Park and Zoo on September 14th, 2016 located at 1903 Forestry Farm Park Dr, Saskatoon, SK. The samples were analyzed for the identification of asbestos. Asbestos **was not** detected in the samples taken during the 2016 re-audit.

The results for the samples submitted were obtained by examination in accordance with the current USEPA 600/R-93/116 Method for the analysis of asbestos in building materials using polarized light microscopy and dispersion staining techniques. The detection limit of this method is listed as less than 1% by volume.

This test report relates only to the materials sent for examination and any use or extension of the information by the client of these results is the responsibility of the client.

If any questions arise on the results of the attached information, please contact our office 306 222 7477. Thank you for this opportunity of service!

Sincerely,



Brad Berschiminsky
Bersch & Associates Ltd.

File: B67BLI14F

Bersch & Associates Ltd.

B67BA114F

Box 3568

Humboldt, Sask. S0K 2A0

BULK SAMPLE ANALYSIS REPORT**PROJECT NO: B67.16****CLIENT: CITY OF SASKATOON****CONTACT: HAZEL FERNANDEZ****LOCATION: FORESTRY FARM ZOO**

NO.	DATE	SAMPLE INFORMATION	ASBESTOS	%	ANALYST
1	3-May-00	Second Floor Storage (Parks Office Building) - Wall Cavity Insulation	No Asbestos Detected		WB
2	3-May-00	Basement Level (Greenhouse) - Grey Mud Compound Remnants	Chrysotile	40%	WB
3	3-May-00	Basement Level (Mechanical Shed) - Beige & Grey Wall Coating Material	Chrysotile	10%	WB
4	3-May-00	Basement Level East Wall (Greenhouse) - Grey/Brown Wall Patch Material	No Asbestos Detected		WB
5	3-May-00	Basement Level Closet (Lunchroom) - Suspect Grey Debris on Floor	No Asbestos Detected		WB
6	3-May-00	Main Level (Lunchroom) - Beige Sheet Flooring	No Asbestos Detected		WB
7	3-May-00	Main Level Storage (Lunchroom) - Sheet Flooring	No Asbestos Detected		WB

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NO.	DATE	SAMPLE INFORMATION	ASBESTOS	%	ANALYST
8	3-May-00	West Storage Shed (Lunchroom) - Transite Board	Chrysotile	20%	WB
9	3-May-00	Concession Building - 12" x 12" Beige Floor Tile	No Asbestos Detected		WB
10	3-May-00	Stairwell (Barn) - Beige Sheet Flooring	No Asbestos Detected		WB
11	3-May-00	Basement (Auditorium) - Spray-Applied Coating Remnants	Chrysotile	10%	WB
12	3-May-00	Basement (Lunchroom) - Parging Compound around Furnace Exhaust Duct	No Asbestos Detected		WB
13	3-May-00	Stairwell (Mechanical Shed) - Fitting Compound Remnants	No Asbestos Detected		WB
14	3-May-00	Main Level (Lunchroom) - 2' x 4' Ceiling Tile	No Asbestos Detected		WB

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NO.	DATE	SAMPLE INFORMATION	ASBESTOS	%	ANALYST
15	10-May-04	Attic (Wolf House) - Spray-Applied Insulation	Chrysotile	30%	WB
16	31-Jul-12	Old Main Office Building - Basement - Paper Wrap on Mechanical	No Asbestos Detected		WB
17	31-Jul-12	Old Main Office Building - Attic - Vermiculite Insulation	Actinolite/ Tremolite	> 0.1%	WB
18	31-Jul-12	Maintenance/ Carpentry Shop - Upper Level Storage - Vermiculite Insulation	No Asbestos Detected		WB
19	14-Sep-16	Storage Room (Old Bunkhouse) - Stipple Ceiling Texture	No Asbestos Detected		WB
20	14-Sep-16	Office Room (Old Bunkhouse) - 1' x 1' Ceiling Tile	No Asbestos Detected		WB
21	14-Sep-16	Kitchen (Old Bunkhouse) - Sheet Flooring Grey W/ Fleck Pattern	No Asbestos Detected		WB

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NO.	DATE	SAMPLE INFORMATION	ASBESTOS	%	ANALYST
22	14-Sep-16	NE Room 2nd Floor (Old Bunkhouse) - Corkboard	No Asbestos Detected		WB
23	14-Sep-16	SW Room 2nd Floor (Old Bunkhouse) - Ceiling Plaster	No Asbestos Detected		WB
24	14-Sep-16	SW Room Attic Stairwell (Old Bunkhouse) - Ceiling Plaster	No Asbestos Detected		WB
25	14-Sep-16	SW Room Attic Stairwell (Old Bunkhouse) - Sheet Flooring Brown W/ Green	No Asbestos Detected		WB
26	14-Sep-16	Basement Cellar Room (Old Bunkhouse) - Sheet Flooring Orange	No Asbestos Detected		WB
27	14-Sep-16	Basement Chimney (Old Bunkhouse) - Brick Mortar	No Asbestos Detected		WB
28	14-Sep-16	Straw Storage Quonset - Shingle	No Asbestos Detected		WB

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NO.	DATE	SAMPLE INFORMATION	ASBESTOS	%	ANALYST
29	14-Sep-16	Basement Pillar (Lunchroom) - Brick Mortar	No Asbestos Detected		WB
30	14-Sep-16	Blacksmith Shed - Chimney Brick Mortar	No Asbestos Detected		WB
31	14-Sep-16	Basement Stairwell (Superintendent Residence) - Brick Mortar	No Asbestos Detected		WB
32	14-Sep-16	Basement Stairwell (Superintendent Res.) - Chimney Brick Mortar	No Asbestos Detected		WB
33	14-Sep-16	Attic Middle (Superintendent Res.) - Insulation	No Asbestos Detected		WB
34	14-Sep-16	Attic East Wall (Superintendent Res.) - Insulation	No Asbestos Detected		WB
35	14-Sep-16	2nd Floor (Superintendent Res.) - Plaster Wall	No Asbestos Detected		WB

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NO.	DATE	SAMPLE INFORMATION	ASBESTOS	%	ANALYST
36	14-Sep-16	Basement Men's Washroom (Lunchroom) - 12" x 12" Ceiling Tile	No Asbestos Detected		WB
37	14-Sep-16	Concession Booth - Linoleum	No Asbestos Detected		WB
38	14-Sep-16	Stairwell (Horse Barn) - Linoleum	No Asbestos Detected		WB
39	14-Sep-16	Shed (West of Quarantine) - Tar Paper	No Asbestos Detected		WB

APPENDIX II

ASBESTOS SURVEY DATABASE

Forestry Farm Zoo 2016														
		SAMPLE DATA												
Building	Location	SAMPLE SAMPLE REP	Sample ID	Date DD/MM/YY	Asbestos Type	% of Asbestos	Trade name ACM Product	Condition	Priority	Description of Sample Location	Asbestos Content In Area	Potential for Disturbance	Recommended Action	Comments
5 Sheds by Quarantine											No Accessible ACM			
Administration Centre											No Accessible ACM			
Administration Garage											No Accessible ACM			
Arch Rib #1											No Accessible ACM			
Arch Rib #2											No Accessible ACM			
Auditorium (Hall)	Basement	Sample	B67-ASB.11	03-May-00	Chrysotile	10%	Spray-Applied Insulation	Good	3	Basement (Auditorium) - Spray-Applied Coating Remnants	Spray-Applied Insulation	Low	Manage	
Barn	Stairwell	Sample	B67-ASB.10	03-May-00	No Asbestos Detected					Stairwell (Barn) - Beige Sheet Flooring	No Accessible ACM			
Barn	Stairwell	Sample	B67-ASB.38	14-Sep-16	No Asbestos Detected					Stairwell (Horse Barn) - Linoleum	No Accessible ACM			
Bear Exhibit											No Accessible ACM			
Bear Shelter											No Accessible ACM			
Bison and Whitetail Shelter											No Accessible ACM			
Blacksmith Shop	Main	Sample	B67-ASB.30	14-Sep-16	No Asbestos Detected					Blacksmith Shed - Chimney Brick Mortar	No Accessible ACM			
Bunkhouse											No Accessible ACM			
Caribou Shelter											No Accessible ACM			
Carpentry Shop	Upper Level Storage	Sample	B67-ASB.18	31-Jul-12	No Asbestos Detected					Maintenance/ Carpentry Shop - Upper Level Storage - Vermiculite Insulation	No Accessible ACM			
Commissary											No Accessible ACM			
Concession	Main Room	Sample	B67-ASB.9	03-May-00	No Asbestos Detected					Concession Building - 12" x 12" Beige Floor Tile	No Accessible ACM			
Concession	Main Room	Sample	B67-ASB.37	14-Sep-16	No Asbestos Detected					Concession Booth - Linoleum	No Accessible ACM			
Cricket Club Pavilion											No Accessible ACM			
Education Centre											No Accessible ACM			
Elk Shelter											No Accessible ACM			
Entrance Building											No Accessible ACM			
Fencing Shed											No Accessible ACM			
Fox Shelter											No Accessible ACM			
Garage #1											No Accessible ACM			
Garage #2											No Accessible ACM			
Greenhouse	Basement	Sample	B67-ASB.2	03-May-00	Chrysotile	40%	Mud compound			Basement Level (Greenhouse) - Grey Mud Compound Remnants	No Accessible ACM			Removed
Greenhouse	Basement	Sample	B67-ASB.4	03-May-00	No Asbestos Detected					Basement Level East Wall (Greenhouse) - Grey/Brown Wall Patch Material	No Accessible ACM			
Horse Shelter											No Accessible ACM			
Lions Pavilion											No Accessible ACM			
Old Main Office Building	Attic Space	Sample	B67-ASB.17	31-Jul-12	Actinolite/ Tremolite	>0.1%	Vermiculite	Good	3	Old Main Office Building - Attic - Vermiculite Insulation	Vermiculite	Low	Manage	
Maintenance Building	Basement	Sample	B67-ASB.16	31-Jul-12	No Asbestos Detected					Old Main Office Building - Basement - Paper Wrap on Mechanical	No Accessible ACM			
Maintenance Building	Furnace Room	Sample Rep	B67-ASB.17	31-Jul-12	Actinolite/ Tremolite	>0.1%	Vermiculite	Good	3	Old Main Office Building - Attic - Vermiculite Insulation	Vermiculite	Low	Manage	
Maintenance Building	Kitchen Area	Sample Rep	B67-ASB.17	31-Jul-12	Actinolite/ Tremolite	>0.1%	Vermiculite	Good	3	Old Main Office Building - Attic - Vermiculite Insulation	Vermiculite	Low	Manage	

Forestry Farm Zoo 2016														
SAMPLE DATA														
Building	Location	SAMPLE SAMPLE REP	Sample ID	Date DD/MM/YY	Asbestos Type	% of Asbestos	Trade name ACM Product	Condition	Priority	Description of Sample Location	Asbestos Content In Area	Potential for Disturbance	Recommended Action	Comments
Maintenance Building	Stairwell	Sample Rep	B67-ASB.17	31-Jul-12	Actinolite/ Tremolite	>0.1%	Vermiculite	Good	3	Old Main Office Building - Attic - Vermiculite Insulation	Vermiculite	Low	Manage	
Maintenance Building	Storage Room #1	Sample Rep	B67-ASB.17	31-Jul-12	Actinolite/ Tremolite	>0.1%	Vermiculite	Good	3	Old Main Office Building - Attic - Vermiculite Insulation	Vermiculite	Low	Manage	
Maintenance Building	Storage Room #2	Sample Rep	B67-ASB.17	31-Jul-12	Actinolite/ Tremolite	>0.1%	Vermiculite	Good	3	Old Main Office Building - Attic - Vermiculite Insulation	Vermiculite	Low	Manage	
Maintenance Building	Equipment Storage	Sample Rep	B67-ASB.17	31-Jul-12	Actinolite/ Tremolite	>0.1%	Vermiculite	Good	3	Old Main Office Building - Attic - Vermiculite Insulation	Vermiculite	Low	Manage	
Mechanical Shed	Basement	Sample	B67-ASB.3	03-May-00	Chrysotile	10%	Mud compound			Basement Level (Mechanical Shed) - Beige & Grey Wall Coating Material	No Accessible ACM			Removed
Mechanical Shed	Stairwell	Sample	B67-ASB.13	03-May-00	No Asbestos Detected					Stairwell (Mechanical Shed) - Fitting Compound Remnants	No Accessible ACM			
Monkey House											No Accessible ACM			
Moose House											No Accessible ACM			
Noah's Ark											No Accessible ACM			
Old Bunkhouse	Storage Room	Sample	B67-ASB.19	14-Sep-16	No Asbestos Detected					Storage Room (Old Bunkhouse) - Stipple Ceiling Texture	No Accessible ACM			
Old Bunkhouse	Office Rom	Sample	B67-ASB.20	14-Sep-16	No Asbestos Detected					Office Room (Old Bunkhouse) - 1' x 1' Ceiling Tile	No Accessible ACM			
Old Bunkhouse	Kitchen Area	Sample	B67-ASB.21	14-Sep-16	No Asbestos Detected					Kitchen (Old Bunkhouse) - Sheet Flooring Grey W/ Fleck Pattern	No Accessible ACM			
Old Bunkhouse	2nd Floor Bedroom	Sample	B67-ASB.22	14-Sep-16	No Asbestos Detected					NE Room 2nd Floor (Old Bunkhouse) - Corkboard	No Accessible ACM			
Old Bunkhouse	2nd Floor Bedroom	Sample	B67-ASB.23	14-Sep-16	No Asbestos Detected					SW Room 2nd Floor (Old Bunkhouse) - Ceiling Plaster	No Accessible ACM			
Old Bunkhouse	Attic Stairwell	Sample	B67-ASB.24	14-Sep-16	No Asbestos Detected					SW Room Attic Stairwell (Old Bunkhouse) - Ceiling Plaster	No Accessible ACM			
Old Bunkhouse	Attic Stairwell	Sample	B67-ASB.25	14-Sep-16	No Asbestos Detected					SW Room Attic Stairwell (Old Bunkhouse) - Sheet Flooring Brown W/ Green	No Accessible ACM			
Old Bunkhouse	Attic Stairwell	Sample	B67-ASB.26	14-Sep-16	No Asbestos Detected					Basement Cellar Room (Old Bunkhouse) - Sheet Flooring Orange	No Accessible ACM			
Old Bunkhouse	Basement Cellar Room	Sample	B67-ASB.27	14-Sep-16	No Asbestos Detected					Basement Chimney (Old Bunkhouse) - Brick Mortar	No Accessible ACM			
Park's Office Building	Second Floor Storage	Sample	B67-ASB.1	03-May-00	No Asbestos Detected					Second Floor Storage (Parks Office Building) - Wall Cavity Insulation	No Accessible ACM			
Pere David											No Accessible ACM			
Portable Washroom											No Accessible ACM			
Poultry Shelter											No Accessible ACM			
Quarantine											No Accessible ACM			
Quonset #1	Roof	Sample	B67-ASB.28	14-Sep-16	No Asbestos Detected					Straw Storage Quonset - Shingle	No Accessible ACM			
Quonset #2	Roof	Sample Rep	B67-ASB.28	14-Sep-16	No Asbestos Detected					Straw Storage Quonset - Shingle	No Accessible ACM			

Forestry Farm Zoo 2016														
		SAMPLE DATA												
Building	Location	SAMPLE SAMPLE REP	Sample ID	Date DD/MM/YY	Asbestos Type	% of Asbestos	Trade name ACM Product	Condition	Priority	Description of Sample Location	Asbestos Content In Area	Potential for Disturbance	Recommended Action	Comments
Rain Shelter											No Accessible ACM			
Raptor Roost											No Accessible ACM			
Residence Garage											No Accessible ACM			
Service Booth											No Accessible ACM			
Shed by Quarantine Storage Building	Main	Sample	B67-ASB.39	14-Sep-16	No Asbestos Detected					Shed (West of Quarantine) - Tar Paper	No Accessible ACM			
Superintendent Res.	Basement Stairwell	Sample	B67-ASB.31	14-Sep-16	No Asbestos Detected					Basement Stairwell (Superintendent Residence) - Brick Mortar	No Accessible ACM			
Superintendent Res.	Basement Stairwell	Sample	B67-ASB.32	14-Sep-16	No Asbestos Detected					Basement Stairwell (Superintendent Res.) - Chimney Brick Mortar	No Accessible ACM			
Superintendent Res.	Attic	Sample	B67-ASB.33	14-Sep-16	No Asbestos Detected					Attic Middle (Superintendent Res.) - Insulation	No Accessible ACM			
Superintendent Res.	Attic	Sample	B67-ASB.34	14-Sep-16	No Asbestos Detected					Attic East Wall (Superintendent Res.) - Insulation	No Accessible ACM			
Superintendent Res. Washrooms	2nd Floor	Sample	B67-ASB.35	14-Sep-16	No Asbestos Detected					2nd Floor (Superintendent Res.) - Plaster Wall	No Accessible ACM			
Wolf Shelter	Attic Space	Sample	B67-ASB.15	10-May-04	Chrysotile	30%	Spray-Applied Insulation	Good	3	Attic (Wolf House) - Spray-Applied Insulation	Spray-Applied Insulation	Low/Mod	Manage	
Zone 4 Offices and Lunchroom	Basement Closet	Sample	B67-ASB.5	03-May-00	No Asbestos Detected					Basement Level Closet (Lunchroom) - Suspect Grey Debris on Floor	No Accessible ACM			
Zone 4 Offices and Lunchroom	Main Level	Sample	B67-ASB.6	03-May-00	No Asbestos Detected					Main Level (Lunchroom) - Beige Sheet Flooring	No Accessible ACM			
Zone 4 Offices and Lunchroom	Main Level Storage	Sample	B67-ASB.7	03-May-00	No Asbestos Detected					Main Level Storage (Lunchroom) - Sheet Flooring	No Accessible ACM			
Zone 4 Offices and Lunchroom	West Storage Shed	Sample	B67-ASB.8	03-May-00	Chrysotile	20%	Transite Board			West Storage Shed (Lunchroom) - Transite Board	No Accessible ACM			Removed
Zone 4 Offices and Lunchroom	Basement	Sample	B67-ASB.12	03-May-00	No Asbestos Detected					Basement (Lunchroom) - Parging Compound around Furnace Exhaust Duct	No Accessible ACM			
Zone 4 Offices and Lunchroom	Main Level	Sample	B67-ASB.14	03-May-00	No Asbestos Detected					Main Level (Lunchroom) - 2' x 4' Ceiling Tile	No Accessible ACM			
Zone 4 Offices and Lunchroom	Basement Pillar	Sample	B67-ASB.29	14-Sep-16	No Asbestos Detected					Basement Pillar (Lunchroom) - Brick Mortar	No Accessible ACM			
Zone 4 Offices and Lunchroom	Basement Men's Washroom	Sample	B67-ASB.36	14-Sep-16	No Asbestos Detected					Basement Men's Washroom (Lunchroom) - 12" x 12" Ceiling Tile	No Accessible ACM			

APPENDIX III

**ASBESTOS CONTAINING
MATERIALS LEGEND**

Bersch & Associates Ltd.

Asbestos Identification Program

AT	Acoustical Ceiling Tile
CB	Cement Board
CP	Cement Pipe
CT	Counter Top
DC	Drywall Taping Compound
FH	Fume Hood
FS	Firestop
FD	Fire Damper
GT	Gasket
HD	Heat Deflector
MI	Mechanical Duct Insulation
PF	Pipeline Fittings
LP	Lineal Pipe Insulation
PL	Plaster
SF	Spray-Applied Fireproofing
TC	Textured Ceiling
TW	Thermal Wrap / Tape
VF	Vinyl Sheet Floor
VT	Vinyl Asbestos Floor Tile
VM	Vermiculite
VI	Vessel / Boiler / Tank Insulation

Bersch & Associates Ltd.
Asbestos ID Program



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Other: _____

**CITY OF SASKATOON
FORESTRY FARM ZOO
SASKATOON, SASKATCHEWAN**

ASBESTOS SURVEY REPORT

AUGUST 2012

**Prepared for: Dale Hrynuik – City of Saskatoon
Prepared by: Bersch & Associates Ltd.
Project No. B67.12**

1.0 INTRODUCTION

Bersch & Associates Ltd. was retained by Dale Hrynuik with the City of Saskatoon to conduct an inspection of the asbestos containing material at the Forestry Farm Zoo located in Saskatoon, SK. The purpose of the inspection was to identify any changes in conditions of remaining ACM and to update the current survey report. Dustin Fraess & Brad Berschminsky of Bersch & Associates Ltd. conducted the re-audit survey of the Forestry Farm Zoo in August 2012. This report gives an account of the results of the inspection and our firm's recommendations on control options to be implemented to bring the Forestry Farm into compliance with the Province of Saskatchewan Occupational Health and Safety Act and Regulations.

2.0 METHODOLOGY

In August 2012, Dustin Fraess & Brad Berschminsky of Bersch & Associates Ltd. conducted the re-audit of the Forestry Farm. The primary documents for guidance and criteria in this survey were the Province of Saskatchewan "Occupational Health and Safety Act and Regulations, 1996", Province of Saskatchewan, "Management of Asbestos", and the U.S. Environmental Protection Agency "Guidance for Controlling Asbestos Containing Materials in Buildings. The USEPA document identifies factors associated with the "condition" and the "potential for disturbance or erosion" of asbestos containing materials (ACM). These factors help to define potential for exposure of ACM and were used to make a qualitative evaluation of the material. It should be noted that the recommendation of a "Management" Asbestos Abatement Action is based upon the premise that renovations are not scheduled in that area that will require disturbing or violating the asbestos containing material. In the event that renovations are scheduled that impact upon the areas of asbestos containing material then pre-removal of the asbestos containing materials may be necessary.

In total, 3 bulk samples of the suspect asbestos containing materials were collected from Forestry Farm during the re-audit. Actinolite/ Tremolite asbestos was detected in 1 of the samples collected. Refer to Appendix I for a copy of the Bulk Analysis Report. The result for sample #1 was obtained by examination in accordance with the current USEPA 600/R-93/116 Method for the analysis of asbestos in building materials using polarized light microscopy and dispersion staining techniques. The detection limit of this method is listed as greater than 1% by volume.

The results for samples #2 & #3 were analyzed in accordance with the EPA 600/R-93/116 method for 0.1% target analytical sensitivity using analytical electron microscopy. The detection limit for this analytical method is listed as greater than 0.1% amphibole asbestos.

The laboratory detected actinolite/tremolite (amphibole) asbestos greater than 0.1% by weight within sample #2. Based on the sample results, the material is classified as a **hazardous** material. Materials containing greater than 0.1% asbestos by weight are considered to be

asbestos-containing materials and must be handled as such. Please refer to the attached analytical report for the sample results.

3.0 EXECUTIVE SUMMARY

The survey of the Forestry Farm in Saskatoon entailed the re-inspection of all asbestos containing material (ACM) located at the facility. Also further testing was conducted of other suspect materials found during the re-audit. New materials tested include mechanical paper wrapping and vermiculite insulation. Laboratory results indicated that “Actinolite/ Tremolite” asbestos is present within the vermiculite insulation found in the Old Main Office building attic. Refer to Appendix I for Bulk Sample Analysis results. All accessible ACM within the facility was clearly identified to eliminate uncertainty of asbestos content. The identification of this material is as follows:

- The vermiculite insulation in the attic of the old Main Office building has not been labeled but all the material within the attic should be considered as ACM.
- The access to the enclosed ceiling space of the lunch room and the Wolf House has been labeled with an ‘Asbestos Containing’ label.
- Asbestos containing cement board within the Storage Shed west of the Lunch Room has been identified with a red ‘ASBESTOS’ stencil.

Throughout the survey of the Forestry Farm, asbestos containing materials were assessed and given a priority rating of One, Two, Three or Four, with “One” being the items requiring the most immediate attention.

4.0 SURVEY RESULTS:

The following information is a list of observations of the asbestos containing materials located within the Forestry Farm facility.

.1 OLD MAIN OFFICE BUILDING

1. Asbestos duct wrap remains enclosed within the wall cavities where removal of the material was not possible. The material remains on the ducting leading up through the ceiling of the basement but is enclosed within spray foam. This material may remain in place until construction or demolition of the building involving these areas requires action to be taken.

PRIORITY:	THREE
CONDITION:	GOOD
POTENTIAL FOR DISTURBANCE:	LOW
ACTION:	MANAGE

2. Vermiculite insulation has been observed and sampled within the attic space of the old Main Office building. The results of the analysis show that Actinolite/Tremolite asbestos have been detected within the vermiculite insulation. This material has been observed lying in the perimeter overhang and scattered around adjacent the perimeter of the attic space. It is recommended that the remaining insulation be removed and the immediate area cleaned by a qualified contractor to rid the attic of this material.

PRIORITY: ONE
CONDITION: MODERATE/POOR
POTENTIAL FOR DISTURBANCE: MODERATE
ACTION: REMOVE AND CLEANUP

.2 LUNCH ROOM

1. The attic area of the Lunch Room housed loose fill asbestos insulation. Maintenance personnel informed Bersch & Associates Ltd. That asbestos removal of the attic insulation was conducted several years ago. Following asbestos removal operations the attic access hatch was sealed with silicone and labeled warning of the ACM. Although the ACM was removed, whether or not the area was thoroughly cleaned is unknown. Access to the attic space should be restricted until such a time that access is necessary for maintenance activity. Suspended ceiling tiles below the enclosed ceiling were inspected for any traces of debris, which resulted in none found. Prior to any maintenance personnel entering the enclosed ceiling space, Bersch & Associates Ltd. will remove the sealed access hatch and inspect the area to ensure the area is clean and safe for occupancy.

PRIORITY: THREE
CONDITION: GOOD
POTENTIAL FOR DISTURBANCE: LOW
ACTION: MANAGE
MANAGE

.3 GROUNDS EQUIPMENT STORAGE SHED west of LUNCH ROOM

1. Asbestos containing cement board is present at the perimeter walls of the shed. The board been identified with a red 'ASBESTOS' stencil. A 3" x 2' length of the board in the northwest corner is broken and should be removed. Once the broken pieces are removed the edges should be encapsulated with an appropriate encapsulant. The remaining board should be monitored for further damages and appropriate action taken if any more areas become cracked or broken.

PRIORITY: ONE
CONDITION: MODERATE
POTENTIAL FOR DISTURBANCE: MODERATE
ACTION: REMOVE/ ENCAPSULATE

.4 CONCESSION STORAGE west of LUNCH ROOM

1. Asbestos containing cement board is present at the perimeter walls of the storage area located to the east of the Grounds Equipment Storage. The board been identified with a red 'ASBESTOS' stencil. The lower portion of the wall board at the perimeter has been observed cracked and broken. At minimum the lower portion of this board should be removed but you may consider removal of all board in the north portion of the storage area. If the entire board is not removed the broken pieces should be removed and an encapsulant should be applied to the broken edges. The remaining board should be monitored for further damages and appropriate action taken if any more areas become cracked or broken.

PRIORITY: ONE
CONDITION: MODERATE/ POOR
POTENTIAL FOR DISTURBANCE: MODERATE/HIGH
ACTION: REMOVE/ ENCAPSULATE

.5 AUDITORIUM

1. Asbestos containing cement board remains in the chimney cavity within South Attic due to inaccessibility during removal of the board material. The previous kitchen renovation resulted in the asbestos board material around the chimney being enclosed in drywall. The material may remain in place until future renovations require action to be taken place in this area.

PRIORITY: THREE
CONDITION: GOOD
POTENTIAL FOR DISTURBANCE: MODERATE/ LOW
ACTION: MANAGE

.6 WOLF HOUSE

1. Asbestos containing insulation remains enclosed within the ceiling space of the building. The ceiling has been identified with 'ASBESTOS' labels. This material may remain in place until future renovations require action to be taken in the area. The ceiling space should not be access or tampered with unless proper PPE and precautions are in place.

PRIORITY: THREE
CONDITION: GOOD
POTENTIAL FOR DISTURBANCE: MODERATE/ LOW
ACTION: MANAGE

The remaining rooms in the building which have not been identified in the section above have no identified ACM. Although it should be noted there may be pipeline fittings within the wall cavities and bulkheads that should be treated as asbestos until testing proves otherwise.

Presence of more vermiculite insulation may be possible within wall cavities and ceiling spaces which were inaccessible at the time of the survey. If the material is found during future renovations the material should be sampled and tested for asbestos content before proceeding.

5.0 ASBESTOS ABATEMENT DISCUSSION

Asbestos is a known carcinogen and any release of asbestos fibres into the atmosphere creates a potential health hazard. Although the mechanism and epidemiology of asbestos carcinogenesis is not yet well defined, accumulating evidence suggests the significance of exposure at even very low fibre concentrations and hence human exposure should be kept to a minimum. It should be noted however that asbestos is a natural mineral and a measurable background concentration can be detected in any location sampled (inside buildings, outside buildings, urban, rural, etc.). The recommendations of the report are therefore intended to keep the potential exposure to an absolute minimum with the knowledge that a zero exposure is not possible.

Asbestos containing materials have been used in a wide variety of applications. Of particular concern, is the group of so called friable products. A friable product is one that can be crumbled or reduced to powder or smaller fragments by hand pressure. Publications from the U.S.E.P.A. as early as 1977 have indicated the potential hazard of asbestos exposure in buildings containing these friable products. The two main uses of friable asbestos products are as spray insulation (thermal, acoustic or fireproofing) on deck and/or beams or as thermal insulation on piping or mechanical equipment. A large amount of non-friable asbestos containing materials have also been used in building construction such as asbestos cement board and asbestos containing vinyl flooring.

The mere presence of a friable asbestos containing material does not imply that there is an actual presence of elevated airborne fibre. As numerous studies have indicated, elevated asbestos fibre levels are generally found when settled dust or the actual asbestos containing material itself is disturbed by maintenance, renovation, inadvertent contact or vibration. The factors considered in the Environmental Protection Agency (USEPA) exposure assessment (condition of material, water damage, activity, movement, exposed surface area, accessibility, friability and presence in an air stream) often give some indication of the likelihood of fibre release but are not in any way definitive in determining whether a hazard exists or not. That is, even if the most friable product exists in a building, elevated fibre levels will not likely occur unless there is some disturbance by physical contact, vibration or an air stream. Asbestos containing pipe or mechanical insulation is not considered friable unless the jacketing is deteriorated or is disturbed by maintenance or renovation. There are four possible approaches to control exposure to airborne asbestos once a friable material is identified in a building. These methods briefly are as follows:

A) Removal - Asbestos material is removed and disposed of by burial and replaced by non-asbestos materials.

B) Encapsulation - Asbestos material is coated with a bridging or penetrating sealant.

- C) **Enclosure** - Asbestos containing materials are separated from the building environment by physical airtight and waterproof barriers.
- D) **Management and Custodial Control** - The Province of Saskatchewan Human Resources, Labor and Employment Branch under the Occupational health and Safety Regulations publish a document outlining “The Management of Asbestos”. In the guide for compliance, an action plan is outlined for management of the asbestos materials identified and in summary is:
1. Identification. The Occupational Health & Safety Regulations state that all asbestos containing building materials be clearly marked “ASBESTOS” (where practical) to warn others of the possible exposure to asbestos fibres if disturbed.
 2. Inspection on regular basis is conducted to determine the ongoing condition of the material. As per the Occupational Health & Safety Regulations, 1996 an employer shall ensure that all friable asbestos containing material and all sprayed-on asbestos surfaces are regularly inspected by the employer, or owner and are inspected at least annually by a competent person to confirm that the material is not releasing, and is not likely to release, asbestos dust into the atmosphere. Maintenance staff should be instructed to bring to attention any problem areas they note during daily activities.
 3. Development of Written Work Procedures for maintenance personnel to Control the Hazard of Asbestos, or often arrangements are made for a qualified contractor to conduct the necessary removal/repair prior to the regular staff conducting maintenance. An Asbestos Control Plan needs to be developed that protects the health and safety of all workers in the event of the dispersal of asbestos dust into the atmosphere at a place of employment or worksite. A brief summary of the Asbestos Control Plan is found under Section 337 (2) of the Occupational Health and Safety Regulations, 1996.
 4. Asbestos Abatement Awareness and Low Risk Process Training if the regular maintenance personnel are required to conduct asbestos related activities.

6.0 CONCLUSION

The above recommendations are the most reasonable and cost effective means of controlling the asbestos containing materials located in the Forestry Farm facility. **It should be noted that all pipe fitting compound and other mechanical insulating material and insulation enclosed in wall cavities and bulk heads should be treated as asbestos unless bulk sampling proves otherwise.** Since no inspection work which involved damaging or destroying building components was undertaken during the inspection, ACM might remain enclosed in drywall/plaster wall cavities or ceiling spaces or within block wall cavities.

7.0 REFERENCES

- .1 Province of Saskatchewan "The Occupational Health and Safety Act and The Occupational Health and Safety Regulations", December, 1996.
- .2 Province of Saskatchewan Human Resources, Labor, and Employment "The Management of Asbestos" January 1991.
- .3 USEPA, 1985. U.S. Environmental Protection Agency, "Guidance for Controlling Asbestos-Containing Materials in Buildings". Washington, DC: Office of Toxic Substances, USEPA.
- .4 Environment Management and Protection Act, Saskatchewan Environment, October 2002
- .5 Hazardous Substances and waste Dangerous Goods Regulations, Saskatchewan Environment, April 1989

APPENDIX I

BULK SAMPLE ANALYSIS

BERSCH & ASSOCIATES LTD.

August 21, 2012

City of Saskatoon
1101 Avenue P N
Saskatoon, SK
S7K 0J5

ATTENTION: Dale Hrynuik

SUBJECT: Bulk Material Identification Report

Please find attached our laboratory's results for the bulk samples taken from the Forestry Farm Facility. The samples were forwarded to our Laboratory for the identification of asbestos.

The result for sample #1 was obtained by examination in accordance with the current USEPA 600/R-93/116 Method for the analysis of asbestos in building materials using polarized light microscopy and dispersion staining techniques. The detection limit of this method is listed as greater than 1% by volume.

The results for samples #2 & #3 were analyzed in accordance with the EPA 600/R-93/116 method for 0.1% target analytical sensitivity using analytical electron microscopy. The detection limit for this analytical method is listed as greater than 0.1% amphibole asbestos.

The laboratory detected actinolite/tremolite (amphibole) asbestos greater than 0.1% by weight within sample #2. Based on the sample results, the material is classified as a **hazardous** material. Materials containing greater than 0.1% asbestos by weight are considered to be asbestos-containing materials and must be handled as such. Please refer to the attached analytical report for the sample results.

This test report relates only to the material sent for examination and any use or extension of the information by the client of these results is the responsibility of the client.

If any questions arise on the results of the attached information please contact me at 222-7477. Thank you for this opportunity of service.

Sincerely,

Brad Berschiminsky
Bersch & Associates Ltd.
File: B67BLH21