

NARRATIVE REPORT

1.0 BUILDING INFORMATION

The Heating Plant was originally constructed in 1904; additions and renovations in 1922, 1933, 1962, 1971, 1994, 1997, and 1998 have extended the original building in all directions.

The Heating Plant is a three-story, 20,219 ft² building which primarily serves to house the boilers generating steam for heating purposes throughout the NDSU Campus. In addition, there are several offices and work areas for maintenance personnel.

The interior floor finishes included floor tile and concrete; the interior wall finishes included gypsum wallboard, concrete block, brick, metal, and concrete; and the interior ceiling finishes included ceiling tile, metal, and concrete. The roofing system is a flat rubber-membrane roof and the exterior of the structure is brick and metal.

There are 4 boilers located in the Heating Plant. Boilers #1 (1972), 2 (1978), and 3 (1990) were abated and re-insulated with fiberglass and mineral wool in the 1990s. Boiler #4 (1962) was partially abated in 2006; the top section of the east end of the boiler was abated and re-insulated with fiberglass. The remainder of boiler #4 is insulated with hard insulation (breecching). The piping systems in the building were also abated and re-insulated with fiberglass in the 1990s. However, abandoned pipes insulated with mag block pipe insulation still exist in limited quantities below boiler #4, abandoned pipes insulated with fiberglass/tar wrapped insulation still exist below boiler #1, and some hard fittings on fiberglass insulation still exist in limited quantities throughout the building. A de-aerator tank insulated with hard insulation is located on the second level above room 106. Steam is generated in the building and water enters the building in the southeast corner of room 102 and via a tunnel system below room 105A. HVAC systems located in the building consisted of steam unit heaters.

2.0 ASBESTOS SURVEY INFORMATION

The Heating Plant was surveyed as part of a larger project on NDSU's Fargo, ND Campus. This report is part of "Volume 3" of a nine volume series. This report includes building specific information only; please refer to the opening section of "Volume 3" for methodologies, definitions, and other pertinent supporting information.

A total of 38 samples were collected from suspect asbestos-containing materials (ACM) from the Heating Plant on May 7, 2007, an additional 11 samples were collected on November 20, 2007, an additional 4 samples were collected on November 28, 2007, an additional 9 samples were collected on December 6, 2007, and an additional 6 samples were collected on January 4, 2008. Laboratory analysis results indicate **19 of these samples tested positive for asbestos.**

2.1 Suspect Materials Identified and Sampled

Floor Tile (3 types)	Floor Tile Mastic (3 types)
Wall Coating (on concrete)	Ceiling Tile (2 types)
Mag Block Pipe Insulation	Hard Fittings on Mag Block Insulation
Encapsulant on Fiberglass Insulation (2 types)	Hard Insulation on Boiler #2 MDC
De-Aerator Tank Insulation	Gypsum Wallboard (2 types)
Joint Compound (2 types)	Baseboard Adhesive
Tarpaper Wrap on Pipe (around fiberglass)	Exterior Building Seam Caulk (3 types)

Caulk on Metal Panel	Exterior Window Caulk (3 types)
Sink Undercoating	Exterior Air Vent Caulk
Exterior Door Caulk	Exterior Window Glazing (3 types)
Window Glazing on Door (2 types)	Black Lab Countertop
Hard Insulation on Boiler #1 Valve	Exterior Panel Glazing
Hard Fittings on Fiberglass Insulation (5 types)	Rope Gasket (5 types)
Hard Insulation on Boiler #2 Steam Drum	Boiler #4 Breeching

The Asbestos Bulk Sample Results Table includes asbestos sampling data.

2.2 Asbestos Containing Materials

Mag Block Pipe Insulation
 Hard Fittings on Mag Block Pipe Insulation
 De-Aerator Tank Insulation
 Tarpaper Wrap on Pipe (around fiberglass insulation)
 Building Seam Caulk
 Exterior Door Caulk (2 types)
 Exterior Window Glazing (2 types)
 Boiler #4 Breeching
 Rope Gaskets (on boiler #2 mechanical dust collector)
 Hard Insulation on Boiler #1 Valve (at top of boiler #1)
 Hard Fittings on Fiberglass Insulation (on garden hose domestic water pipes- painted blue)

The ACM Locations/ Friable Materials Assessments Table includes ACM locations data.

2.3 Cost Estimates

Legend Technical Services Inc. estimates abatement costs (removal & disposal) of ACM for the Heating Plant as follows:

ACM	QUANTITY	UNIT COST	TOTAL COST
Asbestos Mag Block Pipe Insulation	6 ft	\$25.00/ ft	\$150.00
Asbestos Hard Fittings on Mag Block Insulation	4 ea	\$25.00/ ea	\$100.00
Asbestos Tarpaper Pipe Wrap	3 ft ²	\$60.00/ ft ²	\$180.00
Asbestos Tank Insulation	781 ft ²	\$7.50/ ft ²	\$5,857.50
Asbestos Building Seam Caulk	296 ft	\$4.00/ ft	\$1,184.00
Asbestos Exterior Door Caulk	4 ea	\$125.00/ ea	\$500.00
Asbestos Window Glazing (all types)	103 ea	\$225.00/ ea	\$23,175.00
Asbestos Boiler Breeching	2,003 ft ²	\$7.50/ ft ²	\$15,022.50
Asbestos Rope Gasket	15 ea	\$100.00	\$1,500.00
Asbestos Hard Fittings on Fiberglass Insulation	14 ea	\$60.00/ ea	\$840.00
Asbestos Hard Insulation on Valve	1	\$60.00	\$60.00
Total Estimated Abatement Costs:			\$48,587.00

2.4 **Survey Notes**

Rope gaskets were sampled throughout the building; from boiler #2, boiler #2 mechanical dust collector, boiler #3, boiler #4, and the equipment in room 111. The only rope gaskets to test positive for asbestos were on the boiler #2 mechanical dust collector.

Hard fittings on fiberglass insulation were sampled throughout the building; from steam heating supply and return pipes (painted yellow and green) on 1st floor in the north section of the building, from garden hose domestic water pipes (painted blue) throughout 1st floor of the building, from the water column off of the steam drum at the top of boiler #2, and from 3 fittings on top of boiler #1. The only hard fittings on fiberglass insulation to test positive for asbestos were the hard fittings on the garden hose domestic water pipes (painted blue). In addition, hard insulation on 1 valve (on top of boiler #1) also tested positive for asbestos.

The equipment in room 111 and the equipment to the east of boiler #2, both have HVAC canvas connectors on them. LEGEND could not collect as sample of the material without causing excessive damage. LEGEND recommends assuming the HVAC canvas connectors to be ACMs. In the future, the material should be surveyed to verify any asbestos content when destructive sampling techniques are useable.

LEGEND TECHNICAL SERVICES, INC.
ACM LOCATIONS/FRIABLE MATERIALS ASSESSMENTS TABLE

LEGEND No. 0700048 (NDSU)
HEATING PLANT (BUILDING A022)

ROOM/ ACM	ASBESTOS TYPE	EST. QUANTITY	ACM TYPE	MATERIAL CONDITION	DAMAGE POTENTIAL	LOW MOD HIGH	ASSESS. CAT. ¹	NOTES
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Boiler #2

Rope Gaskets (on Boiler #2 Mechanical Dust Collector)	50% Chrysotile	15 ea	Friable Miscellaneous	Good	Physical Air Erosion Vibration	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	6	The rope gaskets tested positive on the mechanical dust collector for boiler #2, but tested negative on boiler #2.
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Boiler #4

Boiler #4 Breeching	2% Chrysotile 20% Amosite	2,003 ft ²	Friable TSI	Good	Physical Air Erosion Vibration	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	6	The breach is on boiler #4, from the 1 st floor level to the 3 rd floor level.
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North Basement Room

Tarpaper Pipe Wrap (over fiberglass)	20% Chrysotile	3 ft ²	Friable TSI	Significantly Damaged	Physical Air Erosion Vibration	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	1	The pipes are along the north wall, they have been abandoned.
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South Basement Room Abated May 2010

Mag Block Pipe Insulation	30% Amosite	6 ft	Friable TSI	Significantly Damaged	Physical Air Erosion Vibration	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	1	The pipes are along the south wall, they have been abandoned.
Hard Fittings on Mag Block Insulation	15% Chrysotile 25% Amosite	4 ea	Friable TSI	Significantly Damaged	Physical Air Erosion Vibration	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	1	None.

Room 102

Hard Insulation on Boiler #1 Valve	20% Chrysotile	1 ea	Friable TSI	Significantly Damaged	Physical Air Erosion Vibration	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	1	The valve is at the top of Boiler #1.
Hard Fittings on Fiberglass Insulation	20% Chrysotile 20% Amosite	4 ea	Friable TSI	Good	Physical Air Erosion Vibration	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	6	The fittings are on the garden hose domestic water pipe (painted blue) that runs along the north wall. (two are above room 102A)

* = Non-Friable materials were not assessed

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Window Glazing on Door	3% Chrysotile	1 ea	Non-Friable Miscellaneous	N/A*	N/A*		N/A*	The door is on the west side of the room, it leads to a hallway by room 104A. (west of boiler #2)
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Room 103

Window Glazing on Door	3% Chrysotile	1 ea	Non-Friable Miscellaneous	N/A*	N/A*		N/A*	The door is on the north wall of the room.
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Room 106D

Window Glazing	3% Chrysotile	3 ea	Non-Friable Miscellaneous	N/A*	N/A*		N/A*	The windows are on the south end of the room.
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Room 110

Hard Fittings on Fiberglass Insulation	20% Chrysotile 20% Amosite	10 ea	Friable TSI	Good	Physical Air Erosion Vibration	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	6	Refer to the ACM Locations Map for locations of the fittings in this room; they are on the garden hose domestic water pipes (painted blue)
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Room 111

Building Seam Caulk	3-10% Chrysotile	48 ft	Non-Friable Miscellaneous	N/A*	N/A*		N/A*	The building seam caulk is on the west wall, in three locations.
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2nd Floor (above room 106)

De-Aerator Tank Insulation	20-40% Chrysotile	781 ft ²	Friable TSI	Damaged	Physical Air Erosion Vibration	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	1	The de-aerator tank is located on the 2 nd floor level, above room 106.
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* = Non-Friable materials were not assessed

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ROOM/ ACM	ASBESTOS TYPE	EST. QUANTITY	ACM TYPE	MATERIAL CONDITION	DAMAGE POTENTIAL	LOW MOD HIGH	ASSESS. CAT. ¹	NOTES
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Exterior

Building Seam Caulk	3-10% Chrysotile	248 ft	Non-Friable Miscellaneous	N/A*	N/A*		N/A*	The asbestos building seam caulk is found on the east and south ends of the building, refer to the ACM Locations Map.
Door Caulk	3% Chrysotile	4 ea	Non-Friable Miscellaneous	N/A*	N/A*		N/A*	The asbestos door caulk is found on three doors to room 102 and on door to room 110, refer to the ACM Locations Map.
Window Glazing	3% Chysotile	98 ea	Non-Friable Miscellaneous	N/A*	N/A*		N/A*	The window glazing is found on 97 large windows on the north section of the building and 1 small window on the south end.

¹Assessment Categories:

- 1) Damaged or Significantly Damaged TSI ACM
- 2) Damaged Friable Surfacing ACM
- 3) Significantly Damaged Friable Surfacing ACM
- 4) Damaged or Significantly Damaged Friable Miscellaneous ACM

- 5) ACM with Potential for Damage
- 6) ACM with Potential for Significant Damage
- 7) Any Remaining Friable ACM or Friable Suspected ACM

End