# MGEA Ground Source Heat Pump Commissioning/Completion Form

Permit No.

## Job & Customer Information

Job Type ◯Residential ◯Commercial ◯New ◯Retrofit ◯Replacement

Owners Name | Phone Number

Mailing Address

Address of Installation

Land Description

## Company/Installer Information

Company Name | Accreditation #

Company Address

Designer Name | Certificate #

Installer Name | Certificate #

Loop Installer Name | Certificate #

## General Information on Building

Type of Building (bungalow, cottage, etc.)

**--If Existing Building--**

Existing Heating System | Existing Cooling System

Age of Building | Size of Building in $ft^2$ or $m^2$ (excluding basement)

Geoexchange System Used For ☐ Living Area Space Heating & Cooling ☐ Domestic Water Heating ☐ Pool Water Heating ☐ Heating & Cooling of Other Adjacent Buildings

Other

Date Installation Began | Date Installation Ended | Total System Cost (no tax)

## System Information

Heat Pump # | Manufacturer

Model/Serial # | ARI Certified ◯Yes ◯No

Distribution Type ◯Forced Air ◯Hydronic ◯Combination

Rated Heating Capacity | BTUH at 32°F | Design C.O.P

Rated Cooling Capacity | BTUH at 77°F | Design EER

Desuperheater ◯Yes ◯No | BTUH | Auxiliary Heat ◯Yes ◯No K.W.

Air Filter Installed ◯Yes ◯No Size

Type of Filter ◯Pleated ◯Electrostatic ◯Electronic

Thermostat Make _____ Model # _____

Pumping Unit Make _____ Model # _____

Resilient Pad Installed ◯Yes ◯No P/T Ports Installed ◯Yes ◯No

All Internal Building Piping Insulated ◯Yes ◯No Condensation Drain Connected & Trapped ◯Yes ◯No

Loops Reverse Flushed to Purge Air ◯Yes ◯No

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Building Design Heat Load _____ BTUH Building Design Cool Load _____ BTUH

Percentage Sizing 0% 70% Min. Per CSA 448.2-02

Copy of Load Calculation Included with Start-up Report ◯Yes ◯No

***Loop Information***

Pipe Configuration ◯Vertical ◯Horizontal ◯Lake

**--If Closed Loop--**

Depth of Trenches or Bore Holes _____ Number of Bore Holes _____

Horizontal Trench Pipe Configuration _____

Reynolds Number _____ Calculated Fluid Pressure Drop _____

Antifreeze Type _____ Freezing Point _____

Percentage 0% Flow Constant _____

Bore Hole/Well Logs ◯Yes ◯No Loop Site Map Included ◯Yes ◯No

Tracer Wire Installed ◯Yes ◯No Bore Holes Grouted and Sealed ◯Yes ◯No

Supply & Return Valves Installed Properly and Labelled Accordingly ◯Yes ◯No

Label at Loop Charging Valve Showing Antifreeze Type, Concentration and Date ◯Yes ◯No

Label Showing Contractor Information and Contact Numbers ◯Yes ◯No

***Open Loop Information***

GPM Flow Rate _____ Reject Well Into Same Aquifer as Production Well ◯Yes ◯No

Distance Apart From Supply & Return Wells _____ Solenoid Valves Installed ◯Yes ◯No

Provincial Water Rights Licence # _____

## CFM Calculation/Auxiliary Heat Information

Air In _____ °F Voltage Measured _____

Air Out _____ °F AMPS Measured _____

ΔT 0.00 °F

Auxiliary Heat Capacity _____ K.W.

Fan CFM 0.00

$$\text{Fan CFM} = \frac{\text{V X Amps X 3.412}}{\text{1.08 X } \Delta T}$$

***Unit Operation  *Desuperheater Off***

Entering Fluid Pressure _____ Leaving Fluid Pressure _____ Fluid Pressure Difference 0.00

Flow Rate from Manufacturer Specs _____ gpm

| | Heating °F | Cooling °F | Hydronic °F |
|---|---|---|---|
| Entering Fluid Temperature | | | |
| Leaving Fluid Temperature | | | |
| Fluid Temperature Difference ΔT | 0.00 | 0.00 | 0.00 |
| Entering Air/Fluid Temperature | | | |
| Leaving Air/Fluid Temperature | | | |
| Air/Fluid Temperature Difference ΔT | 0.00 | 0.00 | 0.00 |
| Voltage | | | |
| Total Amps C+F (Compressor & Fan Amps) = | | | |

Heat Transferred (Btuh) = USGPM X ΔT X FC

Where: USGPM = Manufacturer's USGPM Rating From ΔT Measured Across Heat Exchanger

ΔT = Temperature Difference Across Coil

FC = Flow Constant (e.g. 490 for 20% methanol/500 for water) (varies based on type and percentage of antifreeze)

**Heating**

Heat Transferred (HE) = **USGPM** _____ **X Fluid ΔT** _____ **X FC** _____ **= Btuh** 0.00

Power Input (Watts) = **Volts** _____ **X Amps** _____ **X 0.90** (assumed power factor) **= Watts*** 0.00

Power Input (Btuh) = **Watts** 0.00 **X 3.412 =** 0.00 **Btuh**

Total Btuh (HC) = **Heat Transferred** 0.00 **+ Power Input in Btuh** 0.00 **= Total Btuh** 0.00

Instantaneous COP = **Total Btuh** 0.00 **/ Power Input in Btuh** _____ **= Instantaneous COP** 0.00

**Cooling**

Heat Transferred (HR) = **USGPM** _____ **X Fluid ΔT** _____ **X FC** _____ **= Btuh** 0.00

Power Input (Watts) = **Volts** _____ **X Amps** _____ **X 0.90** (assumed power factor) **= Watts*** 0.00

Power Input (Btuh) = **Watts** 0.00 **X 3.412 =** 0.00 **Btuh**

Total Btuh = **Heat Transferred** 0.00 **- Power Input in Btuh** 0.00 **= Total Btuh** 0.00

Instantaneous EER = **Total Btuh** 0.00 **/ Power Input in Watts** 0.00 **= Instantaneous EER** 0.00

HE = Heat of Extraction  HC = Heating Capacity

HR = Heat of Rejection  ΔT = Temperature Difference

*For 3 Phase V X A X 0.90 X 1.73 = WATTS

## Miscellaneous Duct Work Connections

Type ◯ New ◯ Retrofit  Flex Connectors Installed ◯ Yes ◯ No

Plenum Insulated ◯ Yes ◯ No  Air Filter Accessible ◯ Yes ◯ No

R.A. Elbow Insulated ◯ Yes ◯ No  Service Doors Accessible ◯ Yes ◯ No

Size of Existing Ductwork Verified to be Sufficient ◯ Yes ◯ No

## Miscellaneous

Owner Has Been Informed on System Operation, Thermostat Functions, Maintenance Requirements ◯ Yes ◯ No

Manufactured Document and Warranty Information Provided to Owner ◯ Yes ◯ No

Print Form  Reset Form

## General Installation Information & Overall Operation of System (Inspector Only)

| | |
|---|---|
| Piping | ○ Great ○ Good ○ OK ○ Bad |
| Duct Connectors | ○ Great ○ Good ○ OK ○ Bad |
| Unit Installation | ○ Great ○ Good ○ OK ○ Bad |
| Noise Level | ○ Very Loud ○ Loud ○ Quiet ○ Very Quiet |
| Vibrations | |
| System Installation Approved | ○ Yes ○ No |

## Additional Comments & Information

## Declaration of System Compliance

I declare that all the contents of the foregoing Commissioning/Completion Report are true to the best of my knowledge, information, and belief.

Company Name:

Contractor /Installer Name:

Signature:

Date:

(This document represents CSA 448 standards and operational policies and procedures adopted by MGEA)