

<b>Test No.</b> <div style="border: 1px solid black; height: 30px; width: 100%;"></div>
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# Aquifer Test Information

A – Test Information						
Test Location		Well Owner		Test Conducted By		
Aquifer		Confined/Unconfined		Flow Rate (Units)		
Date/Time - Monitoring Start		Pump Type		Flow Rate Measuring Device		
Date/Time - Test Start		Drop Pipe Length (Pump Intake)		Totalizer: End		
Date/Time - Recovery Start		Pumped Well Inner Casing Diameter		Totalizer: - Start		
Date/Time - Test Finish		Pump Pre-lube Time:		= Total Pumped (Units)		
B – Well Information						
Well Name (Unique Number)	Location		Radial Distance (feet)	Measuring Point Desc. (stick-up)	Open Interval (feet, MSL)	Aquifer
	Easting	Northing				
Pumped Well					from to	
Ob-Wells					from to	
					from to	
					from to	
					from to	
C – Data Collection						
File Name: Well Name (Unique Number)	Data Logger Type, SN:	Probe Id., Range (psi)	Static WL at Installation	Transducer Setting Below WL - install	Static WL at Removal	Transducer Setting Below WL - remove
Pumped Well						
Ob-Wells						

Test Notes:

# AQUIFER TEST INFORMATION FORM GUIDANCE

The **Test No.** (shaded box) is reserved for Minnesota Department of Health (MDH) use.

**Page 1 of** \_\_\_ - the total number of pages in the data set.

## **Section A – Test Information**

**Test Location** - the name of the well that is being pumped.

**Well Owner** - the property owner name. (Unless there is a valid existing maintenance agreement between the property owner and a third party.)

**Test Conducted By** - the person and company that is conducting the test.

**Aquifer** – the name and/or type of aquifer being tested.

**Confined/Unconfined** - the hydraulic confining conditions that exist at the pumped well site. Pick the appropriate type.

**DATE/TIME FORMAT STANDARD FOR ALL MEASUREMENTS:** date (MM/DD/YYYY) and time (HH:MM:SS.0) 24-hour format  
Eight o'clock in the evening is indicated by 20:00, not 8 p.m. ("a.m." and "p.m." readings are not acceptable).

**Date/Time Monitoring Start** - date and time that data collection started. (date/time of first reading)

**Date/Time Test Start** - the date and time that the test started, pump turned on.

**Date/Time Recovery Start** - the date and time that the pumping phase ended and recovery started, pump turned off.

**Date/Time Test Finish** - the date and time that the recovery ended, regular water-level measurements were stopped.

**Flow Rate (Units)** - the representative flow rate used for test analysis. Units of gallons per minute is required.

**Flow Rate Measurement Device** - the means by which the pumping rate was measured. This is not the manufacturer of the meter but the type of meter, i.e., turbine, weir, orifice, manometer, bucket, etc.

**Totalizer: End** - the flowmeter totalizer reading at the end of pumping, include units of measure.

**Totalizer: Start** - the flowmeter totalizer reading before the start of pumping, include units of measure.

**Total Pumped (Units)** - the result of subtracting the start from the end totalizer readings, include units of measure.

**Pump Type** - the kind of pump used, i.e., turbine, submersible, etc.

**Drop Pipe Length / Pump Intake Depth** - the distance below ground surface (in feet) from which the pump takes water.

### **DO NOT INSTALL TRANSDUCER BELOW THIS DEPTH.**

**Pumped Well Inner Casing Diameter** - the diameter (in inches) of the well casing that extends to the pumped interval.

**Pump Pre-lube Time** – the time, (minutes and seconds) that the pump start is delayed for lubrication of the bearings. (applies to some turbine pumps)

## **Section B – Well Information**

**Well Name (Unique Well Number)** – The well name (owner) and Minnesota unique well number (UWN). All wells used for the test must have a unique well number, either an eight-digit well number from the well driller's log or a number assigned to those wells without official well records by MGS/MDH. Tests that collect data from a well that is not identified with a unique number will not be accepted by MDH. If a well does not have a UWN or there is some other issue regarding UWNs, contact the MDH Hydrologist. An arbitrary project well id. (i.e. MW-01) is acceptable if accompanied by the UWN.

**Location** - the Easting and Northing of the well. These are the location coordinates in either: 1) the Universal Transverse Mercator (UTM) UTM Zones 14, 15, or 16 North, meters; or 2) latitude and longitude in decimal degrees. Datum is NAD83.

**These are field measurements (GPS), to be reconciled with CWI later.**

**Radial Distance** - straight line distance (feet) between the pumping and observation well(s), as measured in the field.

**Measuring Point Description**- the place on the well structure from which water-level measurements were taken (MP) and stick-up (difference between ground surface and the MP).

**Open Interval** - the depth (feet) or elevation (feet, MSL) of the open or screened interval of the well.

## **C – Data Collection**

**File Name** – Well Name (Unique Number) is required format of computer file name that contains the water level and/or discharge measurements from a specific well. Example: Pine Island 3 (123456) is PI3\_123456

**Data Logger Type** – Manufacturer, Model, Serial no.

**Probe Id., Range** – Transducer Manufacturer, Model, Serial no., PSI range

**Static Water Level at Installation** – Water level below the measuring point (feet) at date/time probe installed in well

**Transducer Setting below WL Install** - the depth below the water surface (feet) that transducer was set at installation.

**Static Water Level at Removal** – Water level below the measuring point (feet) at date/time probe removed from well

**Transducer Setting below WL Remove** - the depth below the water surface (feet) that transducer was set before removal

**Test Notes:** Weather conditions, Problems encountered, Contact Nos., Data file names (if not unique well no.)

To request this document in another format, call (651) 215-0800, TDD (651) 215-0707, or for greater Minnesota through the Minnesota Relay Service at 1-800-627-3529 (ask for [651] 215-0800).

# Aquifer Test Data Form

Test:				By:				Test Date:		Page ____ of ____	
LOCATION (Unique Well Number)	DATE			TIME			Elapsed Time (Minutes)	Depth to Water	Drawdown/ Recovery	Discharge Rate	Remarks: Totalizer, Hold/Cut, etc.
	Mon.	Day	Year	Hour	Min	Sec.					

**Data Notes:**

## AQUIFER TEST DATA FORM AND ELECTRONIC FILE GUIDANCE

**Test** - the name of the facility where the test is being conducted. Required.

**By** - the person taking the readings. This should not be abbreviated to less than a first initial, middle initial, and full last name. Include affiliation (company name). Required.

**Test Date** - the date of the start of the test. Required.

**Page \_\_ of \_\_** - the page number(s) of the data sheet(s) in sequence. Required.

**Location (Unique Well No.)** The well name (owner) and Minnesota unique well number (UWN). All wells used for the test must have a unique well number, either an eight-digit well number from the well driller's log or a number assigned to those wells without official well records by MGS/MDH. Tests that collect data from a well that is not identified with a unique number will not be accepted by MDH. An arbitrary project well id. (i.e. MW-01) is acceptable if accompanied by the UWN. Each reading of water level or discharge must be associated with a unique number. If the well or location of the reading is not a well, (eg. a spring) or there is some other issue regarding UWNs, contact the MDH hydrologist for the appropriate identifier to use. Required.

**DATE/TIME FORMAT STANDARD FOR ALL MEASUREMENTS:** date (MM/DD/YYYY) and time (HH:MM:SS.0) 24-hour format  
Eight o'clock in the evening is indicated by 20:00, not 8 p.m. ("a.m." and "p.m." readings are not acceptable).

**Date** - the month, day, and year that a reading was taken. Required.

**Time** - the hour, minute, and second that a reading was taken. Required.

**Elapsed Time (Minutes)** - the difference in minutes from the time of reading to the start of the test phase: pretest monitoring, pumping, or recovery. As needed for field verification plots.

**Depth to Water** - the distance in feet, tenths, and hundredths of feet from the measuring point to the standing water surface in the well. Inches are not acceptable. Required.

**Drawdown/Recovery** As needed

**Drawdown** is the difference between the water-level reading and the initial (static) water-level reading taken just before the beginning of the test; or

**Recovery** is the difference between the water-level reading and the last reading of the pumping period, just before the pump was turned off. 95% recovery is defined as:  $\text{recovery} / \text{maximum drawdown} = 0.95$

**Discharge Rate**- the instantaneous discharge measurement given by the flow rate measurement device at a particular time. Flowmeter totalizer readings should be recorded in the "Remarks" column. Required.

**Remarks** - includes comments having to do with the test, such as totalizer readings, steel tape – hold/cut notes, changes in personnel, weather, and test conditions, etc. As needed.

### Additional Fields Required in Electronic Files of Aquifer Test Data

**Date/Time** - decimal days calculated with the spreadsheet "=date" function plus time as fractional days, for example: =date(year,month,day)+(hour\*60+minute+second/60)/1440. This makes it easy to do day-date arithmetic.

In the formula above, January 1, 2000 at 10:02:15 is:

=DATE(2000,1,1)+(10\*60+2+15/60)/1440 = 36526.4182291667

For current implementations of MS Excel the custom formatting to display jdate as a date/time string with sufficient significant digits is:

mm/dd/yyyy hh:mm:ss.00

**Elapsed Time** is broken into three different columns, according to the test phase, as follows:

**etsm** - elapsed time in minutes from start of pretest monitoring,

**etp** - elapsed time in minutes from start of pumping, (t) and

**etr** - elapsed time in minutes from start of recovery (t').

The equation for recovery time is:

**Aet (Agarwal equivalent time)** -  $(t_p * t' / t)$  Pumping time [fixed] \* time since start of recovery / time since start of pumping.

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