

**STATE OF MINNESOTA WATER MANAGEMENT PROGRAM
FIVE-YEAR REPORTING
2014**

**Great Lakes- St. Lawrence River Basin Water Resources Compact
Agreement Article 300 – Compact Section 3.4**

GENERAL INFORMATION

1. Lead agency/agencies and contact person(s)

Minnesota Department of Natural Resources (DNR), [Division of Ecological and Water Resources](#) (EWR)

- Julie Ekman, Conservation Assistance and Regulation Section Manager
- Division Water Conservation Program Consultant

2. Water management program implementing laws, regulations and policies.

The Compact, in its entirety, was adopted by Minnesota as: Minnesota Statutes, Section [103G.801](#), Great Lakes – St. Lawrence River Basin Water Resources Compact

Additionally, Minnesota law includes a number of statutes and rules that support or exceed the requirements of Article 4 of the Compact. They are listed below relative to the matching sections of Article 4. All statutes and rules listed are available at <http://www.leg.state.mn.us>

Additional statutes or rules and the relevant Compact Sections they address:

Section 4.1. Water resources inventory, registration and reporting.

Minnesota Statutes, sections [103G.255](#), [.271](#), [.275](#), [.281](#) and [.282](#) Water allocation, control, permit procedures, use reporting and monitoring requirements

Minnesota Rules, parts [6115.0010-6115-0120](#) Permit, inspection and monitoring

Minnesota Rules, parts [6115.0600-6115.0810](#) Water appropriations, use permits and use management plans

Section 4.2. Water conservation and efficiency programs.

Minnesota Statutes, sections [103G.261](#), [.285](#), [.287](#), [.291](#), [.293](#) and [.298](#) Water allocation, surface and groundwater use, deficiency, drought, and landscape irrigation

Minnesota Statutes, sections [103A.001-103A.301](#) Water policy

Minnesota Statutes, sections [103G.001-103G.101](#) Water law, definitions, conservation

Minnesota Statutes, chapter [103H](#) Groundwater Protection

Minnesota Statutes, chapter [103I](#) Wells, Borings, and Underground Use

Minnesota Rules, parts [6115.0600](#), [.0610](#) and [.0770](#) Water conservation

Minnesota Rules, parts [6115.0600-6115.0810](#) Water appropriations and use permits and use management plans

Section 4.8. Prohibition of new or increased diversions.

Minnesota Statutes, section [103G.265](#) Water supply management, consumptive use and diversions

Section 4.10. Management and regulation of new or increased withdrawals and consumptive uses.

Minnesota Statutes, sections [103G.265](#), [.285](#) and [.287](#) Water supply management, ecosystem health, surface and groundwater sustainable uses

Minnesota Rules, parts [6115.0750](#) Amendment to permits

Section 4.12. Applicability.

Minnesota Statutes, sections [103G.275](#) and [.281](#) Monitoring and baseline reporting requirements

Minnesota Rules, parts [6115.0600](#)-[6115.0810](#) Water appropriations, use permits and use management plans

Section 4.15. Assessment of cumulative impacts.

Minnesota Statutes, sections [103G.265](#), [.285](#) and [.287](#) Water supply management, ecosystem health, surface and groundwater sustainable uses

Minnesota Rules, parts [6115.0600](#)-[6115.0810](#) Water appropriations, use permits and use management plans

Minnesota Statutes, section [103B.235](#) Local Water Management Plan.

Minnesota Statutes, section [116B.01](#) Environmental Rights.

Minnesota Statutes, chapter [116D](#) Environmental Policy.

WATER MANAGEMENT PROGRAM

1. Water management program scope and thresholds. While the Compact standard is 100,000 gallons per day, Minnesota's standard is more restrictive. A water appropriation permit from the DNR is required for groundwater and surface water withdrawals that exceed 10,000 gallons per day or one million gallons per year. Those proposing to use groundwater are required to receive preliminary approval from DNR before well construction. Permit requirements apply statewide to all water use sectors. Permit holders annually report monthly water use volumes to the DNR.

While the water appropriation permit program provides the primary regulatory management tool, the water management program is much more complex. Minnesota employs a robust hydrologic data management system that includes climate, stream flow, groundwater, lake level, geologic, plant and animal surveys, ecological functions, and watershed information as a baseline of data which supports decision-making processes. A strong Environmental Review Program coupled with applied technical review of all hydrologic, hydro-geologic and ecological impact analyses are performed for any projects of sufficient magnitude that would cause concerns over sustainable management of the state's natural resources.

Beyond the DNR's direct jurisdiction, we engage with other state environmental agencies, regional and local governments with technical support programs that helps bring integrated and comprehensive natural resource-based planning at the regional and local levels. DNR meets regularly with other agencies to assess drinking water policy issues for an integrated and collaborative approach to managing water resources.

2. Describe specifically how Water Withdrawals in the State are managed by:

a. Sector. Appropriators in all water use sectors are subject to water use permitting and annual reporting requirements (Minnesota Statutes, sections [103G.275](#) and [.281](#); Minnesota Rules, parts [6115.0750](#)). Water appropriation permits specify the authorized source of water, withdrawal rates, annual water volumes, allowable uses, and withdrawal exclusion dates. Permit applications

are evaluated to determine adequacy of water supplies, natural resource impacts, impacts on other users, and water conservation practices (Minnesota Rules, parts [6115.0660-.0690](#)). Permits are permissive only and subject to modification, suspension or termination for violation of permit terms or to protect public interests and natural resources. Self-supply domestic uses for less than 25 persons for general residential purposes and agricultural drainage that does not impact Public Waters are exempt from permit requirements (Minnesota Rules, parts [6115.0620](#)). Permits have not been required for in-stream uses for run-of-the-river hydroelectric power production where the water is not removed from its source.

b. Water source. Permit requirements apply to “waters of the state”, which include surface and underground waters (Minnesota Statutes, sections [103G.255](#)). Applications and permits identify the source of water and the withdrawal location. Separate applications are required for each water source (Minnesota Statutes, sections [103G.271](#) and Minnesota Rules, parts [6115.0660](#)).

c. Quantity. Permits are required for water withdrawals that exceed 10,000 gallons per day or one million gallons per year (Minnesota Statutes, sections [103G.271](#) and Minnesota Rules, part [6115.0620](#)). Authorized water volumes and withdrawal rates are specified on permits. Permit holders submit an annual report of water use that includes monthly volumes (Minnesota Statutes, sections [103G.275](#) and [.281](#); Minnesota Rules, part [6115.0750](#)).

d. Location. Water management is a statewide program under the authority of the DNR. Withdrawal proposals are evaluated in accordance with the law, by location and by water source in order to assess individual and cumulative impacts (Minnesota Statutes, sections [103G.265](#), [.282](#) and [.287](#); Minnesota Rules, part [6115.0670-.0810](#)). Permits identify authorized withdrawal locations (Minnesota Rules, parts [6115.0660](#)).

e. Specific exemptions as allowed in the Agreement and the Compact. Transportation and emergency use exemptions in the Agreement and Compact are exempt from permit requirements or are covered by a general permit (Minnesota Statutes, sections [103G.801](#)).

3. Description of how the provisions of the Standard of Review and Decision are applied.

a. Decision Making Standard for Withdrawals, Consumptive Uses. Statutes and rules cited under General Information, Item 2 define the standards for review and decisions on water use proposals. Minnesota’s requirements are more stringent than the Compact for standards for water withdrawals or uses. A water appropriation permit from the DNR is required for groundwater and surface water withdrawals that exceed 10,000 gallons per day or one million gallons per year. In designated Groundwater Management Areas we have additional authority to regulate quantities less than these standards where necessary (Minnesota Statutes, sections [103G.287](#), [Subd. 4 b](#)). All applications must consider alternatives, including conservation, and are evaluated for impacts to natural resources and other water users. Minnesota’s existing program and regulations meet or exceed the Standard of Review. Those who violate water use laws in Minnesota Statutes, chapter [103G](#) are subject to penalties under a law that is effective January 1, 2015 (Minnesota Statutes, section [103G.299](#)).

b. Exception Standard for Diversions. Diversions are subject to provisions in the Compact, which has been codified in Minnesota Statutes [103G.801](#) and the provisions in Minnesota Statutes, section [103G.265](#). Minnesota’s requirements are as or more restrictive than those required by the Compact.

4. Overview of Database of Withdrawals, Consumptive Uses and Diversions. Water appropriation permittees are required to report annually their water use including monthly water

volumes and other information. There has been a 99.9% compliance rate with water use reporting requirements (failure to report can result in permit termination). Reporting can be done online through the Minnesota DNR Permitting and Reporting ([MPARS](#)) system or using paper documents (examples attached). Minnesota Statutes require flow meters to measure water use, but other methods of measurement can be approved by the DNR (information attached). Permit and water use data are stored within the MPARS database. The data is available from DNR's website at www.dnr.state.mn.us/waters. Consumptive use data reported pursuant to Section 4.1 are estimated by applying a coefficient to the total water use reported in each reporting category. Four permitted water users divert water, within their baseline volume, outside of the Great Lakes basin. Because there are only four permits we track these manually rather than electronically; these data are included in the annual Great Lakes Regional Water Use Database reporting.

5. Permit applications and other program information. Potential water users apply for a permit online using MPARS. Paper [permit applications](#) can be downloaded; an example is attached. Additional program information is available at www.dnr.state.mn.us/waters. Minnesota Rules [6115.0600](#) – [6115.0810](#) define standards for evaluating water appropriation permit requests.

6. Summary of initiatives to support an improved scientific understanding of the surface- and ground- waters of the Basin and impacts from Withdrawals, Consumptive Uses, and Diversions. The framework for improved scientific understanding and sustainable management of Minnesota's water resources is centered in three program areas: mapping; monitoring; and managing. DNR has drafted a [strategic plan](#) for improving its groundwater management. Three pilot areas in the state (none are within the Great Lakes Basin, however) have been designated as groundwater management areas ([GWMA](#)) where the strategic plan's objectives and strategies will be written into a GWMA Plan for DNR implementation.

There are a number of [mining](#) operations within the Basin and along the Basin boundary and much of the geology has been mapped. Ambient and permit required monitoring networks provide data on groundwater levels, surface water levels and flows, precipitation, and water use that are used to evaluate individual and cumulative impacts. Statutes and rules provide for the establishment of resource protection limits including, safe yields for groundwater, protection elevations for water basins, and protected flows for watercourses. Water supply plans and permits must address potential resource impacts and are subject to modification.

New, 2013, legislation requires potential well owners to receive a [preliminary well assessment](#) from DNR before constructing a well that will need a water use permit. DNR provides information on water resources in the area, the likelihood that their project could receive a water use permit, and alerts the applicant to resource concerns and additional monitoring and aquifer testing that they may be required to perform at their expense during the water use permit application process. The potential well owner can then make an informed decision on whether to invest in a well and other equipment.

7. Additional information Mining is one of the largest industries within the Basin and requires large volumes of water. Some of these operations are located along the watershed divide and watershed modifications have been occurring for over one hundred years. The hydrology along

the Basin boundary has been and will continue to be altered by mining activities. DNR issues permits to mine which require the post mining hydrology to be restored as much as practicable. The approved boundaries and water flow will not be effective until after mining stops and gravity drainage resumes, which could be 50 to 70 years from now or longer.

Careful review of any new mining operation is made to evaluate how it will impact watershed boundaries, water quantities for use and discharge, consumptive use, diversions and water quality impacts to receiving waters. Minnesota will follow the Compact requirements and receive necessary reviews and approvals of operations that potentially affect diversions. Water conservation, recycling, reuse, and impacts on hydrologic and ecologic functions are all intensively reviewed for all new or amended projects. Opportunities to remediate older historic projects are also reviewed where opportunities arise.

Attachments

- [Measuring Water Use & Flow Meter Requirements](#)
- Annual Water Use Report Form (agricultural irrigation)
- [Permit Application Form \(non-irrigation\)](#) [note that using the online system, [MPARS](#), is encouraged and is more efficient]
- Public Water Suppliers Questionnaire (printed example from MPARS)
- Example of issued permit (surface water)

2013 MN DNR - Annual Report of Water Use Fee Calculation Worksheet

Permit: **20xx-xxxx** Permitted Volume (MG/Y): **xx.x** Permitted Acres: **xxx** Installations: **x**
Use: **Major Crop Irrigation**

landowner or Agent

Address 1
Address 2
City MN Zip

Please correct address if needed:

Phone: **xxx-xxx-xxxx** Email: _____

1. Enter the total volume of water from all installations of this permit. _____ gallons
If this amount is 0, skip to line 5 and enter \$20.
2. Divide line 1 by one million, round to the nearest decimal place. _____ million gallons
3. If the amount on line 2 is less than 50 million gallons, skip to line 5.
If 50 million gallons or greater, enter the **Fee Rate** from the table. \$ _____ per million gallons

| Volume Pumped (from line 2) | Fee |
|------------------------------|---------------------------------------|
| No water pumped | Minimum permit fee \$20 |
| Less than 50 million gallons | Minimum permit fee \$140 |
| | Fee Rate (per million gallons) |
| 50 to 100 million gallons | \$3.50 |
| 100 to 150 million gallons | \$4.00 |
| 150 to 166.7 million gallons | \$4.50 |
| Over 166.7 million gallons | Maximum permit fee \$750 |

4. Multiply line 2 by line 3 (when volume is 50 MG or greater). \$ _____
5. **Fee Determination**
 - a) If no water was pumped, enter the minimum permit fee of \$20.
 - b) If the amount on line 2 is less than 50 million gallons, enter the minimum permit fee of \$140.
 - c) If the amount on line 4 is greater than \$140 and less than \$750, enter the amount from line 4.
 - d) If the amount on line 4 is greater than \$750, enter the maximum permit fee of \$750.

Return this fee with the water use reports and any additional information required. \$ _____

(355)

paid

Make checks payable to: "MN DNR Eco-Water-Res"
Mail forms and fees to: Minnesota DNR - OMB
500 Lafayette Rd Box 10
St Paul MN 55155

| |
|--------------|
| Check Amt \$ |
| Check # |

**2013 MN DNR - Annual Report of Water Use
Installation Worksheet**

Permit: 20xx-xxxx Installation: **X** _____

Permittee: **Landowner/Agent**

Use: **Major Crop Irrigation**

Source Type: **Ground Water**

Loc: **XXXXXX**

Source Name: _____

XX County

A. If no water was withdrawn this year, indicate the reason.

1. CRP/set aside 2. System removed 3. Water not required
 4. Permit suspended 5. Water received from an alternate source, specify:
 6. Other, specify: _____

B. List the number of **gallons** withdrawn in each month of 2013.

Pumping Rate
in gallons per minute: _____

| | |
|--------------|--|
| April | _____ |
| May | _____ |
| June | _____ |
| July | _____ |
| August | _____ |
| September | _____ |
| October | _____ |
| Total | <div style="border: 1px solid black; width: 200px; height: 20px;"></div> |

C. Indicate the number of acres irrigated and inches of water used for each crop type.

| CROP | #ACRES | INCHES/ACRE | CROP | #ACRES | INCHES/ACRE |
|----------------------------------|--------|-------------|----------------|--------|-------------|
| (31) Field corn | _____ | _____ | (36) Dry Beans | _____ | _____ |
| (32) Potatoes | _____ | _____ | (41) Wheat | _____ | _____ |
| (33) Sugar Beets | _____ | _____ | (43) Alfalfa | _____ | _____ |
| (34) Soybeans | _____ | _____ | | | |
| Fruit/vegetables/other (specify) | _____ | _____ | | | |

D. Measurement method (indicate one)

1. Flow meter
 2. Flow Rate meter with: Totalizer or Hour meter
 3. Timing device with: Hour meter or Electric meter
 4. Alternate method: If not already approved, enclose request for approval
 5. Estimated: An approved measuring device or method is required (describe below)

E. Irrigation system type (indicate one)

1. Center pivot 2. Solid set 3. Towable center pivot
 4. Drip irrigation 5. Traveling gun 6. Other, specify

Signature _____

Date _____

Phone _____

**2013 MN DNR - Annual Report of Water Use
Permit Change Form**

To apply for an amendment, transfer or termination, sign and submit this form
If no changes are required, you do not need to complete this form

| | |
|--|---|
| <p style="text-align: center;">Amendment Request</p> <p style="text-align: center;">Submit if either of the following is true:</p> <p>The volume from line 2 of the Fee Calculation Worksheet exceeds the authorized permit volume of XX.X million gallons, and you expect to exceed this volume in the future.</p> <p style="text-align: center;">or</p> <p>An increase in the pumping rate, an increase to the permitted volume or a change in the number of permitted installations is needed.</p> <p>Include the following supporting materials:</p> <ol style="list-style-type: none"> a. A written amendment request describing changes needed to the existing permit and the reasons for the changes. b. A site map showing location information: <ol style="list-style-type: none"> i. Points of taking (wells or pumps) ii. Lands owned, leased and irrigated c. Parcel ID numbers d. A copy of the water well record for each new well (supplied by the well driller) e. Information for each installation: <ol style="list-style-type: none"> i. Pump capacity ii. Status (active, standby, abandoned) <p style="text-align: center;">Sign Below</p> | <p style="text-align: center;">Transfer Request</p> <p style="text-align: center;">Submit if ownership or control of the property will change</p> <p>a. New owner/lessee information</p> <p>Name _____</p> <p>Address _____</p> <p>Phone _____</p> <p>Email _____</p> <p>b. Date of land sale or transfer _____</p> <p>Include the following supporting materials:</p> <ol style="list-style-type: none"> c. Parcel ID numbers d. A site map showing location information: <ol style="list-style-type: none"> i. Points of taking (wells or pumps) ii. Well Unique # iii. Surface water source/name <p style="text-align: center;">Sign Below</p> |
|--|---|

Termination Request

To terminate the permit, complete the following:

Note: the 2013 water use report and fee are still required

a. Reason: _____

b. Well sealing record # _____ c. Appropriation end date: _____

Sign Below

I hereby attest that I own or control (by lease, license or other permission) the land from which groundwater or surface water will be appropriated. The information submitted and statements made concerning this amendment request are true and correct to the best of my knowledge.

Signature _____ **Phone** _____ **Date** _____
(required)

Print Name _____ Landowner Lessee Authorized Agent



Water Appropriation Permit

Permit Number
2014-1008

Pursuant to Minnesota Statutes, Chapter 103G, and on the basis of statements and information contained in the permit application, letters, maps, and plans submitted by the applicant and other supporting data, all of which are made part hereof by reference, **PERMISSION IS HEREBY GRANTED** to the applicant to perform actions as authorized below.

| | | | | |
|--|-----------------------------------|--|--------------------------------------|--|
| Project Name: Wash low-grade taconite aggregate | County: St. Louis | Watershed: St. Louis River | Resource: Ditch | |
| Purpose of Permit: Sand and Gravel Washing | | Authorized Action: Withdrawal of up to 42.0 million gallons of water per year for sand and gravel washing. | | |
| Permittees (2): UNITED TACONITE LLC CONTACT: MAXWELL, CANDICE, (218) 744-7849 PO BOX 180 EVELETH, MN 55734-0180 (218) 744-7631 LAURENTIAN AGGREGATES, INC CONTACT: PETERS, ANDREW 920 10TH AVENUE NORTH ONALASKA, WI 54650 (608) 779-6608 | | Authorized Agent: LAURENTIAN AGGREGATES, INC CONTACT: PETERS, ANDREW 920 10TH AVENUE NORTH ONALASKA, WI 54650 (608) 779-6608 | | |
| To Appropriate From: Ditch : by means of a portable pump at a rate not to exceed 500 gpm Point(s) of Taking UTM zone 15N, 532640m east, 5258890m north SWNE of Section 25, T58N, R18W | | | | |
| Authorized Issuer: Amy Loiselle | Title: Area Hydrologist | Issued Date: 05/06/2014 | Effective Date: 05/06/2014 | Expiration Date: Long-Term Appropriation |

This permit is granted **subject to** the following **CONDITIONS**:

LIMITATIONS: (a) Any violation of the terms and provisions of this permit and any appropriation of the waters of the state in excess of that authorized hereon shall constitute a violation of Minnesota Statutes, Chapter 103G. (b) This permit shall not be construed as establishing any priority of appropriation of waters of the state. (c) This permit is permissive only. No liability shall be imposed upon or incurred by the State of Minnesota or any of its employees, on account of the granting hereof or on account of any damage to any person or property resulting from any act or omission of the Permittee relating to any matter hereunder. This permit shall not be construed as estopping or limiting any legal claims or right of action of any person other than the state against the Permittee, for any damage or injury resulting from any such act or omission, or as estopping or limiting any legal claim or right of action of the state against the Permittee, for violation of or failure to comply with the provisions of the permit or applicable provisions of law. (d) In all cases where the doing by the Permittee of anything authorized by this permit shall involve the taking, using, or damaging of any property, rights or interests of any other person or persons, or of any publicly owned lands or improvements thereon or interests therein, the Permittee, before proceeding therewith, shall obtain the written consent of all persons, agencies, or authorities concerned, and shall acquire all property, rights, and interests necessary therefore. (e) This permit shall not release the Permittee from any other permit requirements or liability or obligation imposed by Minnesota Statutes, Federal Law, or local ordinances

CONDITIONS (Continued from previous page)

relating thereto and shall remain in force subject to all conditions and limitations now or hereafter imposed by law. (f) Unless explicitly specified, this permit does not authorize any alterations of the beds or banks of any public (protected) waters or wetlands. A separate permit must be obtained from the Department of Natural Resources prior to any such alteration.

WATER USE REPORTING: (a) **FLOW METER** The Permittee shall equip each installation for appropriating or using water with a flow meter, unless another method of measuring the quantity of water appropriated to within ten (10) percent of actual amount withdrawn is approved by the Department. (b) **REPORTS** Monthly records of the amount of water appropriated or used shall be recorded for each installation. Such readings and the total amount of water appropriated or used shall be reported annually to the Director of DNR Ecological and Water Resources, on or before February 15 of the following year, via the MNDNR Permitting and Reporting System (MPARS) at www.mndnr.gov/mpars/signin. Any processing fee required by law or rule shall be submitted with the records whether or not any water was appropriated during the year. Failure to report shall be sufficient cause for terminating the permit 30 days following written notice. (c) **TRANSFER OR ASSIGNMENT** Any transfer or assignment of rights, or sale of property involved hereunder shall be reported within 90 days thereafter to the Director of DNR Ecological and Water Resources. Such notice shall be made by the transferee (i.e., new owner) and shall state the intention to continue the appropriation as stated in the permit. This permit shall not be transferred or assigned except with the written consent of the Commissioner. (d) **MODIFICATION** The Permittee must notify the Commissioner in writing of any proposed changes to the existing permit. This permit shall not be modified without first obtaining the written permission from the Commissioner.

COMMISSIONER'S AUTHORITY: (a) The Commissioner may inspect any installation utilized for the appropriation or use of water. The Permittee shall grant access to the site at all reasonable times and shall supply such information concerning such installation as the Commissioner may require. (b) The Commissioner may, as he/she deems necessary, require the Permittee to install gages and/or observation wells to monitor the impact of the Permittee's appropriation on the water resource and require the Permittee to pay necessary costs of installation and maintenance. (c) The Commissioner may restrict, suspend, amend, or cancel this permit in accordance with applicable laws and rules for any cause for the protection of public interests, or for violation of the provisions of this permit.

PUBLIC RECORD: All data, facts, plans, maps, applications, annual water use reports, and any additional information submitted as part of this permit, and this permit itself are part of the public record and are available for public inspection at the offices of DNR Ecological and Water Resources. The information contained therein may be used by the Division as it deems necessary. The submission of false data, statements, reports, or any such additional information, at any time shall be deemed as just grounds for revocation of this permit.

MONITORING REQUIREMENTS: Minnesota Statutes 103G.282 authorizes the Department of Natural Resources to require permittees to install and maintain monitoring equipment to evaluate water resource impacts from permitted appropriations. You may be required to modify or install automated measuring devices and keep records for each installation. The frequency of measurements and other requirements will be based on quantity of water appropriated, source of water, potential connections to other water resources, nature of concern, and other relevant factors.

DROUGHT PLANNING: In accordance with M.S. 103G.293, all permits must be consistent with the drought response plan detailed in the Statewide Drought Plan at http://files.dnr.state.mn.us/natural_resources/climate/drought/drought_plan_matrix.pdf.

LAND NOT OWNED BY PERMITTEE : This permit authorizes appropriation of water from land that is not owned by the permittee. The volume authorized is valid only as long as an agreement is in effect for lands included under this permit that are not owned by the permittee.

WATER USE CONFLICT: If notified by the DNR that a water use conflict is suspected and probable from your appropriation, based on confirmation of a formal well interference complaint or a preliminary hydrologic assessment, all appropriation authorized by this permit must cease immediately until the interference is resolved. The permittee may be required to obtain additional data to support the technical analysis, such as domestic well information within a radius of one and one-half miles of the production well. The permittee and impacted party may engage in a negotiated settlement process and there may be modifications made to this permit in support of conflict resolution.

SUSPENSION: The Department may require the suspension of appropriation during periods of low water in order to maintain minimum water levels within the basin/watercourse/watershed.

CONTINGENCY: If directed by DNR Ecological and Water Resources to cease pumping, the permittee agrees to withstand the results of no appropriation as stated in the contingency statement submitted with the application.

CONDITIONS (Continued from previous page)

INTAKE: All pump intakes must be screened to prevent fish from being drawn into the system.

INVASIVE SPECIES - EQUIPMENT DECONTAMINATION: All equipment intended for use at a project site must be free of prohibited invasive species and aquatic plants prior to being transported into or within the state and placed into state waters. All equipment used in designated infested waters, shall be inspected by the Permittee or their authorized agent and adequately decontaminated prior to being transported from the worksite. The DNR is available to train inspectors and/or assist in these inspections. For more information refer to the "Best Practices for Preventing the Spread of Aquatic Invasive Species" at http://files.dnr.state.mn.us/publications/ewr/invasives/ais/best_practices_for_prevention_ais.pdf. Contact your regional Invasive Species Specialist for assistance at www.mndnr.gov/invasives/contacts.html. A list of designated infested waters is available at http://files.dnr.state.mn.us/eco/invasives/infested_waters.pdf. A list of prohibited invasive species is available at www.mndnr.gov/eco/invasives/laws.html#prohibited.

INFESTED WATERS - WATER TREATMENT REQUIREMENTS: Surface water appropriators from waters listed as containing invasive species in http://files.dnr.state.mn.us/eco/invasives/infested_waters.pdf are required to contact 651-259-5100 or 1-888-MINN-DNR to obtain information from the DNR Division of Ecological and Water Resources on specific invasive species water treatment requirements.

INFESTED WATERS - UNUSED WATER: To prevent the spread of invasive species, all unused water appropriated under this permit must either be returned to its source or discharged on land. This permit is not valid for appropriations from surface water sources that are infested with invasive species without separate authorization from the DNR Division of Ecological and Water Resources. Refer to the DNR website for a current list of designated infested waters: http://files.dnr.state.mn.us/eco/invasives/infested_waters.pdf.

WATER CONSERVATION: All practical and feasible water conservation methods and practices must be employed to promote sound water management and use the least amount of water necessary, such as reuse and recycling water, water-saving devices, and water storage.

DISCHARGE AUTHORIZATION: This permit is valid only in conjunction with all required discharge authorizations from local, state, or federal government units.

cc: Matthew Frericks, Conservation Officer, Virginia
Amy Loiseau, MNDNR EWR
Mike Crotteau, MNDNR EWR
Rian Reed, DNR Regional Environmental Assessment Ecologist, Region 2
Tom Rusch, DNR Wildlife, Tower
Edie Evarts, DNR Fisheries, Tower Area
Mark Lindhorst, County, St. Louis
Catherine Voce, Corps of Engineers, St. Louis (North)
Leslie Day, Corps of Engineers, St. Louis (North)
Craig Wainio, City, Mountain Iron

Measuring Water Use & Flow Meter Requirements

Flow Meter Requirements

Minnesota Statutes § 103G.281, Subdivision 2, requires all installations for appropriating water to be equipped with a flow meter to measure the quantity of water appropriated within the degree of accuracy required by rule (10%). The commissioner may approve alternate methods of measurement based on the quantity of water used, the method of appropriating or using water and any other information supplied by an applicant.

Why require Flow Meters ?

The law is aimed at improving the accuracy of water use reporting and has many benefits. Careful monitoring of water withdrawals can be used to: provide valuable information for management of the resource, detect well and pump problems, improve irrigation efficiency, and determine pumping plant efficiency. As a management tool, accurate flow monitoring can help to conserve both energy and water resources. Accurate data is necessary to evaluate the capability of the resource to sustain water withdrawals and is also important for investigation of well interference complaints.

Does everyone need a flow meter ?

All new permitted installations will be required to have flow meters unless **prior** DNR approval has been given for an alternate method. Existing systems may be allowed to use an approved alternate method. Depending upon the type of system, water use and quantity of water used, the commissioner may approve alternate methods for measuring water use. Requests for approval of alternate methods must be submitted in writing to DNR Waters. Proper record keeping is required for all approved methods of determining water use.

When is a flow meter required ?

Flow meters are required when alternate methods cannot provide an accurate measurement of water use. Flow meters will be required where the following circumstances exist:

1. Systems with widely fluctuating discharge rates or when variable speed pumps are used.
2. Systems with alternating zone coverage, such as golf course irrigation systems.
3. Instances where the permit holder has a history of providing inaccurate pumping reports or has failed to submit water use fees and reports.
4. Situations where the adequacy of the resource is a concern or there is a history of well interference problems.

What methods are approved ?

The following methods are approved for measuring water use:

1. Flow meters with a totalizer.
2. Flow rate meters used with timing devices. † ‡
3. Timing devices (hour meters and electric meters). † ‡
4. Vehicle gallon capacities (i.e. water trucks). †

† Daily records of water use and time pumped **must** be kept for these methods.

‡ Methods 2 and 3 **are required** to have a **constant** pumping rate.

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Special instructions regarding gravity flow operations are available by calling DNR Waters and requesting the "Measuring Appropriations from Gravity Flow Installations" information sheet.

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1. Rain gauges or other methods using application rates, such as irrigation systems that are set to apply a certain amount of water per acre or pass.
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How do I get my method approved ?

Each year permittees are required to sign an affidavit of compliance on the water use report indicating compliance with the law requiring a flow meter or an approved measuring device. The affidavit of compliance and the annual report of water use are due by February 15 of each year.

Permittees using a method of measurement that has not been approved must submit a written request for approval of an alternate method. Requests should include a detailed description of the proposed method (i.e. diagrams, calculations). Requests for approval of an alternate method should be sent to DNR Waters, Permits Unit, 500 Lafayette Road, St. Paul, MN 55155-4032. Only methods that measure water use within 10 percent accuracy will be considered for approval. Records of water use must be kept for all methods of water use.

Failure to have an approved method is a violation of Minnesota Statutes and permit conditions and is punishable as a misdemeanor with fines up to \$700 and/or 90 days in jail.

General

To obtain information about the purchase and/or installation of a flow meter, contact a licensed well driller, irrigation equipment dealer or plumbing supply company.

(continued on next page)

Minnesota DNR Waters

651-259-5700

This information is available in an alternative format upon request

Calculating Monthly Water Use

To calculate monthly water use from:

A. **Flow Meter:** Subtract the reading at the beginning of the month from the reading at the end of the month. If the meter is in cubic feet, multiply the monthly use by 7.48 to convert the usage into gallons.

B. **Timing Device:** Multiply the hours pumped for the month by the pump rate (in gallons per minute, gpm) times 60 (minutes). [Example; 150 hrs x 800 gpm x 60 min/hr = 7,200,00 gallons].

Hourly timing device options:

1. An hourly time clock connected directly to irrigation pumping plant system.
2. Kilowatt Hours: Monthly hours of pumping determined by dividing monthly electric usage by electric meter's monthly power demand rate (Kw). [Example: 3000 Kwh of electricity was used in the month of June and the electric meter recorded a peak demand for the month of 25 Kw, then the total hours pumped is found by dividing 3000 Kwh by 25 Kw, which yields 120 hours pumped for the month. To find water use take 120 hrs x 300 gpm x 60 min/hr = 2,160,000 gallons].

* Approved Alternatives for Estimating Water Pumping Rate from Agricultural Irrigation Systems

The following alternate methods are approved by the Department for agricultural irrigation systems.

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- Lateral line irrigation systems nozzleing chart.

- _____ gph per 100' of trickle tube* _____ feet/100 = _____ gpm
- Open discharge pump's manufacture curve.

ESTIMATING DISCHARGE OF A CENTER PIVOT WITH CORNER UNIT

A good average discharge flow rate estimate for a center pivot with a corner arm can be determined by taking the average of the discharge rate when the corner arm is fully extended and fully retracted.

The water discharge from a center pivot with a corner swing arm varies depending on the position of the swing arm, usage of flow control/regulators, and the slope of the pump performance curve.

STEPS TO ESTIMATE GPM FOR A TRAVELING GUN

1. Determine nozzle size to nearest 1/100th of an inch and nozzle type (bore or ring): [ex: 1-1/4" = 1.25 inches taper & bore nozzle].
2. Determine average operating pressure at the base of the sprinkler. If pressure varies between first and last travel runs, take the average between the first and last runs: [ex: 1st run = 95 psi, last run = 85 psi, average = (95 + 85)/2 = 90 psi].
3. Select the appropriate discharge table (bore or ring nozzle) listed below and find the estimated gpm for your nozzle size and average operating pressure or use gun manufacturer's published discharge table.

If your nozzle size or operating pressure values follow between the table numbers, make an interpolation between the smaller and larger numbers to get a more accurate estimate of flow: [ex: have 1.25" bore nozzle @ 90 psi; table gives at 90 psi 405 gpm @ 1.2" and 545 @ 1.4"; then to estimate the gpm for 1.25" nozzle calculate as follows:

$$\begin{aligned} \text{gpm} &= 405 \text{ gpm} + [(1.25" - 1.2") / (1.4" - 1.2")] * (545 \\ &\quad \text{gpm} - 405 \text{ gpm}) \\ &= 405 + (0.05 / 0.20) * 140 \\ &= 405 + 0.25 * 140 \\ &= 405 + 35 = 440 \text{ gpm} \end{aligned}$$

Typical Discharges for Single Large Nozzle Sprinkler Guns

| Sprinkler Pressure (psi) | Straight or taper bore nozzle sizes (inches) | | | | |
|--------------------------|--|-----|-----|-----|-----|
| | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 |
| | Sprinkler discharge in gpm | | | | |
| 60 | 145 | 225 | 330 | 445 | 585 |
| 70 | 155 | 245 | 355 | 480 | 630 |
| 80 | 165 | 260 | 380 | 515 | 675 |
| 90 | 175 | 275 | 405 | 545 | 715 |
| 100 | 185 | 290 | 425 | 575 | 755 |
| 110 | 195 | 305 | 445 | 605 | 790 |
| 120 | 205 | 320 | 465 | 630 | 825 |

| psi | Ring Nozzle Sizes (inches) | | | | |
|-----|----------------------------|-----|-----|-----|-----|
| | 0.9 | 1.1 | 1.3 | 1.5 | 1.7 |
| | Sprinkler discharge in gpm | | | | |
| 60 | 110 | 185 | 275 | 385 | 510 |
| 70 | 120 | 200 | 295 | 410 | 550 |
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| 100 | 140 | 240 | 340 | 485 | 655 |
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Table Sources: Nelson Irrigation Corp. - sprinkler charts. Rain Bird, Agri Products Division - sprinkler charts. SCS National Sprinkler Irrigation Book - Chapter 15.

*Prepared by: Jerry Wright, Extension Agricultural Engineer, University of Minnesota, 1990.

Equal opportunity to participate in and benefit from programs of the Minnesota Department of Natural Resources is available to all individuals regardless of race, color, national origin, sex, sexual orientation, marital status, status with regard to public assistance, age or disability. Discrimination inquiries should be sent to: MN/DNR, 500 Lafayette Road, St. Paul, MN 55155-4031; or the Equal Opportunity Office, Department of the Interior, Washington, D.C. 20240.

The DNR Information Center phone numbers:

Twin Cities: (651)296-6157
 MN Toll Free: 1-888-646-6367 (or 888-MINNDNR)
 Telecommunication Device for the Deaf:
 (651)296-5484
 1-800-657-3929 MN Toll Free



A-02623-06
(Rev. 3/06)

Permit Application for Appropriation of Waters of the State NON-IRRIGATION

WARNING: ALL INFORMATION AND SUPPORTING DOCUMENTS SUBMITTED AS PART OF THIS APPLICATION BECOME PUBLIC INFORMATION. Omission of any data requested will delay the processing of your application and may result in its denial.

WHO APPLIES: Any individual, agency, corporation, or entity appropriating in **excess of 10,000 gallons/day and/or 1 million gallons/year** must obtain a Water Appropriation Permit from the Department of Natural Resources as prescribed by Minnesota Statutes, Chapter 103G and Minnesota Rules 6115.0600-6115.0810.

PROCEEDING WITHOUT A PERMIT. Any appropriation in excess of the above stated amounts without a permit constitutes a misdemeanor.
Note: Other federal, state, or local permits or approvals may also be required which are the responsibility of the applicant to obtain.

Application Instructions

Each number below corresponds to the appropriate section on the application form. Read **ALL** instructions carefully before filling out the application. Please type or print clearly.

APPLICANT

1-6. Fill in as directed.

PROJECT INFORMATION

7. PURPOSE: Mark the box that best describes your project and provide a written explanation of what the water will be used for. Attach a letter of explanation if there is not enough space on the application to completely describe the purpose of the project and how the water is used.

Note: Temporary appropriations are one-time projects that do not continue from year to year. Temporary permits are issued for appropriations with durations of up to 12 months. Time extensions may be requested, but the total length of time the permit remains in force cannot exceed two years.

8. SOURCE OF WATER: Mark only one box.

Note: Submit one application for each source of water or system. For example, several wells in the same aquifer manifolded into **one system** constitute **one source**; however, a stream and a gravel pit are **two** sources of water and would require separate applications. (Contact a DNR Waters office if you are unsure whether your project would require one or more applications).

a. WELL - Submit 1) a copy of the official **Water Well Record**, 2) test hole logs and 3) pumping test data, all of which are available from the driller.

Note: Applications for dewatering projects can be submitted before the wells are constructed. Information on the estimated diameter, depth and location of all dewatering wells must be submitted with the application. Water Well Records must be submitted upon completion of well construction. When Water Well Records are not required by Minnesota Rules relating to wells and borings, then a summary of the actual depth, diameter, static water level and location of each well must be submitted.

b. MANIFOLD WELLS - Indicate the number of wells to be manifolded into one system. Submit the SAME information requested in 8.a. for EACH well to be used.

Note: If your well(s) is located in an aquifer for which hydrologic data are limited or unavailable, you may request to submit data regarding area wells.

c. STREAM, DITCH, or RIVER - Identify it and submit a **contingency plan** describing the alternatives you would utilize if the appropriation is restricted because of low water conditions. If no alternative water supply is available, you must submit a written statement agreeing to withstand the results of no appropriation.

Note: Only temporary appropriations from designated trout streams may be approved.

d. WETLAND, LAKE or IMPOUNDMENT - Identify it and submit the following:

1) A contingency plan (see 8.c.).

2) For basins less than 500 acres in size you must:

a) Notify all riparian landowners and submit a list of those landowners.

b) Obtain a signed statement from as many of those riparian landowners as possible which states their support of the proposed appropriation.

c) Provide an accounting of the number of signatures of riparian owners you are unable to obtain.

e. OTHER - Gravel pits, farm ponds, dug pits, etc. Submit information on:

1) Physical dimensions (length-width-depth)

2) Depth to water from land surface

Note: Any proposed alteration of the beds or banks of the above mentioned water basins or streams may require a public waters permit from this Department. This may also include the construction of a pit in a wetland area. Contact a DNR Waters office for details.

9. POINT(S) OF TAKING/PUMPING SITE(S): Indicate the location of your well(s) or pumping site by completing a.-e. Indicate this location to the nearest 10-acre tract by completing a. (ex. NW1/4 of NE 1/4 of SE 1/4). If you plan to install multiple wells or pumping sites, attach a letter of explanation including the legal description of each well/pump site, its pumping rate and method of measurement.

10. MEANS OF TAKING AND RATE: If you mark "d", specify the method to be used and the rate of taking (in gallons per minute or cubic feet per second). If multiple wells or pump sites are to be used, attach a letter of explanation (see #9).

11. METHOD OF MEASUREMENT: Fill in as appropriate.

Note: Flow meters are required by Minnesota Statutes 103G.281, Subdivision 2, for measuring the quantity of water appropriated within the degree of accuracy required by rule (10%). The DNR can approve other methods of measurement. Timing devices, including hour meters and electric meters, are approved devices if there is a constant rate of appropriation. To obtain approval for other methods of measurement, applicants must submit a written request with the application that includes a description of the proposed method.

Also of Note: All permit holders are required to measure and keep monthly and yearly records of the quantity of water used or appropriated.

12. MEANS OF CONVEYANCE: Fill in as appropriate.

13. LEGAL DESCRIPTION: Describe the property that will be affected by your project (example: T101N, R14W, Section 5, NW1/4 and N1/2 SW1/4). **If property other than what you own will be affected, you must attach a copy of the land agreement** which includes a) the legal description of the property, b) the termination date of the agreement, and c) the signature of all parties.

14. MONTHS OF APPROPRIATION: Fill in as appropriate.

15. SCHEDULE OF APPROPRIATION: Mark only one box to indicate your schedule. For temporary projects, the appropriate year(s) should be included with the beginning/ending dates.

16. TOTAL ANNUAL USE: (In million of gallons per year).

Note: Appropriation in excess of 2 million gallons/day may need legislative approval (See Minnesota Statutes 103G.265, Subdivision 3, for exemptions); appropriation averaging 30 million gallons/month for commercial or industrial purposes may require the preparation of an Environmental Assessment Worksheet (see Minnesota Rules 4410.4300, Subpart 24).

17-19. Complete if applicable. In Question 17, indicate the quantity of water to be discharged.

20. ADDITIONAL REQUIREMENTS: Submit the following as part of your application. All applications must include:

- a. Map or air photo showing the project site.
- b. Describe alternative sources of water and methods, including conservation practices that were considered and why the proposed alternative was selected.
- c. Additional documents, letters, or statements required.

21. APPLICATION FEE: A minimum application fee of \$150 is required for each permit application. An application fee of \$300 is required for after-the-fact permit applications. Water use reporting and fees for years in which water appropriations occurred without a permit will also apply. **Please do not submit fees with the permit application, you will be billed separately.** Permits cannot be issued until all fees have been paid.

MAILING: Submit the following to the appropriate DNR Area office (see map on back page for addresses):

- 1) application (keep a copy for your records).
- 2) supporting documents.
- 3) **do not send application fee with the application. You will be billed separately.**

Make sure that you furnish all information that is requested. Forms that are incorrectly filled out or lack requested information will cause a delay in your application.

LOCAL REVIEW: Minnesota Statutes allow local units of government 30 days to review your project and submit comments to the DNR.

A copy of your application will be submitted by the DNR to:

- 1) local soil & water conservation district
- 2) watershed district
- 3) city

ADDITIONAL DATA: You may be required to submit additional information regarding your project. You will be notified if this information is required.

Questions

If you have any questions on the procedure for completing the application, please contact the DNR Area office serving you. The address and telephone number of each DNR office can be found on the back side of the application form.

Northwest Region 1

Stephanie Klamm

Stephanie.klamm@state.mn.us
246 125th Ave NE
Thief River Falls, MN 56701
(218) 681-0947 ext 223
FAX (218) 681-0948
Kittson/Marshall/Pennington
Polk/Red Lake/Roseau

Darrin Hoverson

darrin.hoverson@state.mn.us
Cass/Hubbard
27841 Forest Ln
Park Rapids MN 56470
(218) 699-7297
FAX (218) 699-7299

Dan Thul

dan.thul@state.mn.us
Beltrami/Clearwater
Lake of the Woods

2115 Birchmont Beach NE
Bemidji, MN 56601
(218) 308-2676
FAX (218) 755-4066

Vacant

14583 County Hwy 19
Detroit Lakes, MN 56501
(218) 846-8383
FAX (218) 846-8397
Becker/Clay/Mahnomen
Norman

Julie Aadland ext 243

julie.aadland@state.mn.us
Otter Tail/Traverse/Wadena
Wilkin

Emily Siira ext 232

emily.siira@state.mn.us
Douglas/Grant/Pope/Stevens

1509 1st Ave N
Fergus Falls, MN 56537
(218) 739-7576
FAX (218) 739-7601

Northeast Region 2

Amy Loiselle

amy.loiselle@state.mn.us
7979 Highway 37
Eveleth, MN 55734
(218) 744-7450 ext 222
FAX (218) 744-7451
St. Louis

Erika Herr

erika.herr@state.mn.us
1201 East Highway 2
Grand Rapids, MN 55744
(218) 327-4106
FAX (218) 327-4263
Itasca/Koochiching

Patricia Fowler

patricia.fowler@state.mn.us
Carlton/Duluth Metro Area

Cliff Bentley

cliff.bentley@state.mn.us
Cook/Lake

1568 Highway 2
Two Harbors, MN 55616
(218) 834-1440
FAX (218) 834-6639

Heidi Lindgren

Heidi.lindgren@state.mn.us
Aitkin/Crow Wing/Pine

1601 Minnesota Drive
Brainerd, MN 56401
(218) 833-8689
FAX (218) 828-6043

Central Region 3

Crystal Payment

crystal.payment@state.mn.us
16543 Haven Road
Little Falls, MN 56345
(320) 616-2450 ext 234
FAX (320) 616-2473
Mille Lacs/Morrison/Todd

Nicola Blake-Bradley

nicola.blake-bradley@state.mn.us
(320) 223-7844
Benton/Stearns

Roger Stradal

roger.stradal@state.mn.us
(320) 223-7850
Sherburne/Wright

940 Industrial Dr. S #103
Sauk Rapids, MN 56379
(320) 223-7840

Craig Wills

craig.wills@state.mn.us
800 Oak Savanna Ln SW
Cambridge, MN 55008
(763) 689-7100 ext 225
FAX (763) 689-7120
Chisago/Isanti/Kanabec

Jack Gleason

john.gleason@state.mn.us
Carver/Hennepin-South

Kate Drewry

kate.drewry@state.mn.us
Anoka/Hennepin-North

Molly Shodeen

molly.shodeen@state.mn.us
Ramsey/Washington

Jennie Skancke

Dakota/Scott

1200 Warner Road
St Paul, MN 55106
(651) 259-5845
FAX (651) 772-7977

Bill Huber

bill.huber@state.mn.us
1801 South Oak Street
Lake City, MN 55041
(651) 345-5601 ext 244
FAX (651) 345-3975
Goodhue/Wabasha/Winona

www.mndnr.gov/contact/ewr.html

Region 1-Northwest
Region 2-Northeast
Region 3-Central
Region 4-South

South Region 4

Ethan Jenzen

ethan.jenzen@state.mn.us
164 County Rd 8 NE
PO Box 457
Spicer, MN 56288
(320) 796-2161 ext 232
Bigstone/Chippewa/Kandiyohi/
Meeker/Swift

Lucas Youngsma

lucas.youngsma@state.mn.us
1400 E. Lyon, Box 111
Marshall, MN 56258
(507) 537-7258
Lac Qui Parle/Lincoln/Lyon/
Redwood/Yellow Medicine

Brian Nyborg

175 County Road 26
Windom, MN 56101-1868
(507) 831-2900 ext 224
Cottonwood/Jackson/Murray
Nobles/Pipestone/Rock

Dan Girolamo

dan.girolamo@state.mn.us
50507 Sakata Lake State Park Rd
Waterville MN 56096
(507)362-8778
Blue Earth/Faribault/Martin/
Rice/Steele/ Waseca

Scott Bohling

scott.bohling@state.mn.us
Watonwan/Brown
21009 547th Ave
Mankato, MN 56001
(507) 389-2151
Watonwan/Brown

Garry Bennett

garry.bennett@state.mn.us
20596 Highway 7
Hutchinson, MN 55350
(320) 234-2550 ext 230
Brown/McLeod/Renville/Sibley/
Le Sueur

Corey Hanson (Region 3)

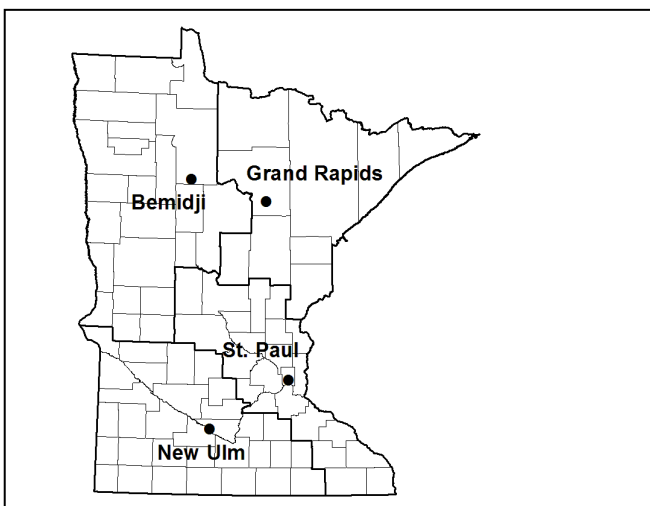
corey.hanson@state.mn.us
(507) 206-2854
Fillmore/Houston/Olmsted

Randy Bradt (Region 4)

randy.bradt@state.mn.us
(507) 206-2851
Dodge/Mower/Freeborn

3555 9th Street NW, Suite 350
Rochester, MN 55901

3/19/2014



Measuring Water Use & Flow Meter Requirements

Flow Meter Requirements

Minnesota Statutes § 103G.281, Subdivision 2, requires all installations for appropriating water to be equipped with a flow meter to measure the quantity of water appropriated within the degree of accuracy required by rule (10%). The commissioner may approve alternate methods of measurement based on the quantity of water used, the method of appropriating or using water and any other information supplied by an applicant.

Why require Flow Meters ?

The law is aimed at improving the accuracy of water use reporting and has many benefits. Careful monitoring of water withdrawals can be used to: provide valuable information for management of the resource, detect well and pump problems, improve irrigation efficiency, and determine pumping plant efficiency. As a management tool, accurate flow monitoring can help to conserve both energy and water resources. Accurate data is necessary to evaluate the capability of the resource to sustain water withdrawals and is also important for investigation of well interference complaints.

Does everyone need a flow meter ?

All new permitted installations will be required to have flow meters unless **prior** DNR approval has been given for an alternate method. Existing systems may be allowed to use an approved alternate method. Depending upon the type of system, water use and quantity of water used, the commissioner may approve alternate methods for measuring water use. Requests for approval of alternate methods must be submitted in writing to DNR Waters. Proper record keeping is required for all approved methods of determining water use.

When is a flow meter required ?

Flow meters are required when alternate methods cannot provide an accurate measurement of water use. Flow meters will be required where the following circumstances exist:

1. Systems with widely fluctuating discharge rates or when variable speed pumps are used.
2. Systems with alternating zone coverage, such as golf course irrigation systems.
3. Instances where the permit holder has a history of providing inaccurate pumping reports or has failed to submit water use fees and reports.
4. Situations where the adequacy of the resource is a concern or there is a history of well interference problems.

What methods are approved ?

The following methods are approved for measuring water use:

1. Flow meters with a totalizer.
2. Flow rate meters used with timing devices. † ‡
3. Timing devices (hour meters and electric meters). † ‡
4. Vehicle gallon capacities (i.e. water trucks). †

† Daily records of water use and time pumped **must** be kept for these methods.

‡ Methods 2 and 3 **are required** to have a **constant** pumping rate.

What if I am using a gravity flow system ?

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2. Buckets used to measure discharge rates.
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How do I get my method approved ?

Each year permittees are required to sign an affidavit of compliance on the water use report indicating compliance with the law requiring a flow meter or an approved measuring device. The affidavit of compliance and the annual report of water use are due by February 15 of each year.

Permittees using a method of measurement that has not been approved must submit a written request for approval of an alternate method. Requests should include a detailed description of the proposed method (i.e. diagrams, calculations). Requests for approval of an alternate method should be sent to DNR Waters, Permits Unit, 500 Lafayette Road, St. Paul, MN 55155-4032. Only methods that measure water use within 10 percent accuracy will be considered for approval. Records of water use must be kept for all methods of water use.

Failure to have an approved method is a violation of Minnesota Statutes and permit conditions and is punishable as a misdemeanor with fines up to \$700 and/or 90 days in jail.

General

To obtain information about the purchase and/or installation of a flow meter, contact a licensed well driller, irrigation equipment dealer or plumbing supply company.

(continued on next page)

Minnesota DNR EWR

651-259-5700

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To calculate monthly water use from:

A. **Flow Meter:** Subtract the reading at the beginning of the month from the reading at the end of the month. If the meter is in cubic feet, multiply the monthly use by 7.48 to convert the usage into gallons.

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Hourly timing device options:

1. An hourly time clock connected directly to irrigation pumping plant system.
2. Kilowatt Hours: Monthly hours of pumping determined by dividing monthly electric usage by electric meter's monthly power demand rate (Kw). [Example: 3000 Kwh of electricity was used in the month of June and the electric meter recorded a peak demand for the month of 25 Kw, then the total hours pumped is found by dividing 3000 Kwh by 25 Kw, which yields 120 hours pumped for the month. To find water use take 120 hrs x 300 gpm x 60 min/hr = 2,160,000 gallons].

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- Open discharge pump's manufacture curve.

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A good average discharge flow rate estimate for a center pivot with a corner arm can be determined by taking the average of the discharge rate when the corner arm is fully extended and fully retracted.

The water discharge from a center pivot with a corner swing arm varies depending on the position of the swing arm, usage of flow control/regulators, and the slope of the pump performance curve.

STEPS TO ESTIMATE GPM FOR A TRAVELING GUN

1. Determine nozzle size to nearest 1/100th of an inch and nozzle type (bore or ring): [ex: 1-1/4" = 1.25 inches taper & bore nozzle].
2. Determine average operating pressure at the base of the sprinkler. If pressure varies between first and last travel runs, take the average between the first and last runs: [ex: 1st run = 95 psi, last run = 85 psi, average = (95 + 85)/2 = 90 psi].
3. Select the appropriate discharge table (bore or ring nozzle) listed below and find the estimated gpm for your nozzle size and average operating pressure or use gun manufacturer's published discharge table.

If your nozzle size or operating pressure values follow between the table numbers, make an interpolation between the smaller and larger numbers to get a more accurate estimate of flow: [ex: have 1.25" bore nozzle @ 90 psi; table gives at 90 psi 405 gpm @ 1.2" and 545 @ 1.4"; then to estimate the gpm for 1.25" nozzle calculate as follows:

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Typical Discharges for Single Large Nozzle Sprinkler Guns

| Sprinkler Pressure (psi) | Straight or taper bore nozzle sizes (inches) | | | | |
|--------------------------|--|-----|-----|-----|-----|
| | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 |
| | Sprinkler discharge in gpm | | | | |
| 60 | 145 | 225 | 330 | 445 | 585 |
| 70 | 155 | 245 | 355 | 480 | 630 |
| 80 | 165 | 260 | 380 | 515 | 675 |
| 90 | 175 | 275 | 405 | 545 | 715 |
| 100 | 185 | 290 | 425 | 575 | 755 |
| 110 | 195 | 305 | 445 | 605 | 790 |
| 120 | 205 | 320 | 465 | 630 | 825 |

| (psi) | Ring Nozzle Sizes (inches) | | | | |
|-------|----------------------------|-----|-----|-----|-----|
| | 0.9 | 1.1 | 1.3 | 1.5 | 1.7 |
| | Sprinkler discharge in gpm | | | | |
| 60 | 110 | 185 | 275 | 385 | 510 |
| 70 | 120 | 200 | 295 | 410 | 550 |
| 80 | 130 | 215 | 310 | 435 | 585 |
| 90 | 135 | 225 | 325 | 460 | 620 |
| 100 | 140 | 240 | 340 | 485 | 655 |
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Table Sources: Nelson Irrigation Corp. - sprinkler charts. Rain Bird, Agri Products Division - sprinkler charts. SCS National Sprinkler Irrigation Book - Chapter 15.

*Prepared by: Jerry Wright, Extension Agricultural Engineer, University of Minnesota, 1990.

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The DNR Information Center phone numbers:

Twin Cities: (651)296-6157
 MN Toll Free: 1-888-646-6367 (or 888-MINNDNR)
 Telecommunication Device for the Deaf:
 (651)296-5484
 1-800-657-3929 MN Toll Free

Individual Permit: 1961-0761

Status: **Initial Amendment Review**

Created by: Jesh, Diane on 02/04/2014 08:35 AM

Last Update: Jesh, Diane on 02/04/2014 08:35 AM

Report Status: In Process

Public Water Supply Inventory for 2013

Please answer the following questions regarding your public water supply system. If you have more than 1 permit, consolidate your data before providing the information.

Water supply systems serving less than 1,000 people are only required to answer question 1. All other systems should provide as much information as possible.

Permittee: **Albany, City Of**

I have already filled out this consolidated form under another permit number.

Enter the list of permit numbers (XXXX-XXXX) covered by this survey.

| |
|-----------|
| 1961-0761 |
|-----------|

1. What is the population served by your water supply system? (Make a reasonable estimate if value is unknown)

2. What is the source of this population estimate?

3. What is the year of the population estimate?

4. What was the maximum volume of water (in gallons) used during a single day in 2013?

5. On what date was the maximum volume pumped?

6. Select the type of rate structure your city uses.

7. Do you have a DNR approved water conservation rate?

8. Provide an online link to your water rate schedule in the box below or upload a file under Attachments.

Attachments

Document Type File

[Add attachment](#)

Enter the amount of water used for the following categories. If you maintain records of customer categories that are different than those listed, select “Add a New Category” at the bottom and provide your own definition.

Note: Connections should be the total number of connections in each category. Metered connections are the number which are individually measured.

Residential - Water used for normal residential purposes such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, watering lawns and garden.

Gallons delivered:

of Connections:

of Metered connections:

Commercial - Water used for motels, hotels, restaurants, office buildings, commercial facilities, and institutions both civilian and military.

Gallons delivered:

of Connections:

of Metered connections:

Industrial - Water used for thermoelectric power (electric utility generation) and other industrial uses such as steel, chemical and allied products, paper and allied products, mining, and petroleum refining.

Gallons delivered:

of Connections:

of Metered connections:

Agricultural/Irrigation - Water used for crop irrigation, livestock watering, chemigation, golf course irrigation, landscape and athletic field irrigation.

Gallons delivered:

of Connections:

of Metered connections:

Water Supplier Services - Water used for public services such as hydrant flushing, ice skating rinks, public swimming pools.

Gallons delivered:

of Connections:

of Metered connections:

[Add a New Category](#) *(You may create up to 2 of your own categories)*

Totals:

Gallons delivered:

0

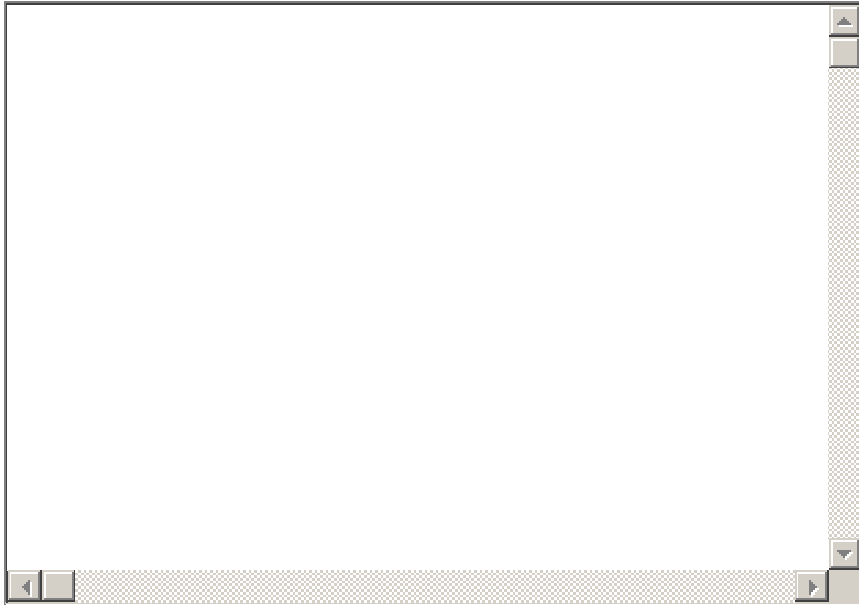
of Connections:

0

of Metered Connections:

0

Enter any additional comments



I attest that I am submitting consolidated data for water use year 2013 for this Public Water Supply system.

I agree with the above statement.