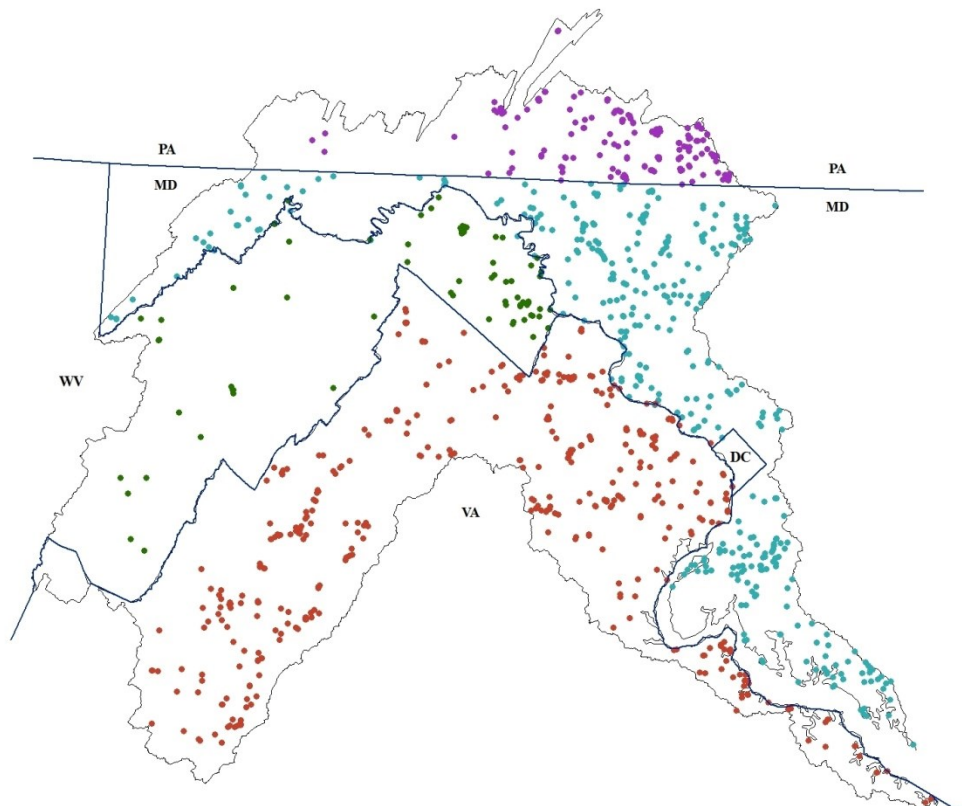


# Potomac Basin Water Withdrawals

---

## *Evaluation of State Water Withdrawal Data Collection and Recommendations for Aligning Efforts*



Prepared in  
partial fulfillment of the requirements of  
U.S. EPA Grant No. I-98339411

Prepared by  
James B. Palmer and Heidi L.N. Moltz

Interstate Commission on the Potomac River Basin  
30 West Gude Drive, Suite 450  
Rockville, MD 20850

September 2013, Revised June 2015

ICPRB Report No. ICPRB-13-8

This report is available online at [www.PotomacRiver.org](http://www.PotomacRiver.org).

**Front Cover**

The map displays the locations of reported water withdrawals in the Potomac River basin using 2005 state reported data.

**Disclaimer**

The opinions expressed in this report are those of the authors and should not be construed as representing the opinions or policies of the United States government or the signatories or Commissioners to the Interstate Commission on the Potomac River Basin.

## Table of Contents

Table of Contents .....	iii
List of Tables .....	iii
List of Appendices .....	iii
Abbreviations .....	iv
Units of Measure .....	iv
Introduction .....	1
State Data .....	2
Maryland .....	2
Pennsylvania .....	2
Virginia .....	3
West Virginia .....	3
State Summary .....	4
Common State Data Elements .....	4
Proposed List of Database Elements .....	5
Recommendations .....	7
Un-reported Withdrawals .....	7
Standard Industry Codes .....	7
Water Use Codes .....	7
Multiple Water Uses per Withdrawal .....	8
Days of Withdrawal .....	8
Source Aquifer .....	8
Data Errors .....	9
Data Availability .....	9
Other Information .....	9
Discussion and Next Steps .....	10
References .....	11

## List of Tables

<b>Table 1.</b> Number of uses by type, from 2005 withdrawal data compiled by ICPRB .....	4
<b>Table 2.</b> Partial list of data elements recorded by each state .....	5
<b>Table 3.</b> Draft list of withdrawal data elements for basin-wide database .....	6

## List of Appendices

**Appendix A.** State permit application forms

**Appendix B.** Example state withdrawal reporting forms

**Appendix C.** Comparison tables of select state water withdrawal database field types

## Abbreviations

CO-OP	ICPRB Section for Cooperative Water Supply Operations on the Potomac
FIPS	Federal Information Processing Standard
GW	Groundwater
GWMA	Virginia Groundwater Management Area
HUC	Hydrologic Unit Code
ICPRB	Interstate Commission on the Potomac River Basin
Id	Identification
JPA	Joint Permit Application
MD	Maryland
MDE	Maryland Department of the Environment
NAICS	North American Industry Classification System
PA	Pennsylvania
PADEP	Pennsylvania Department of Environmental Protection
PennDOT	Pennsylvania Department of Transportation
SIC	Standard Industrial Classification
SW	Surface water
U.S.	United States
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VA	Virginia
VADEQ	Virginia Department of Environmental Quality
VDH	Virginia Department of Health
VPDES	Virginia Pollutant Discharge Elimination System
VWP	Virginia Water Protection
WUDS	Water Use Data System
WV	West Virginia
WVDEP	West Virginia Department of Environmental Protection

## Units of Measure

gal	Gallons
gpd	Gallons per day
Mgal	Million gallons
Mgal/m	Million gallons per month
Mgal/y	Million gallons per year
sq. mi.	Square miles

## Introduction

Surface- and ground-water resources are withdrawn for numerous beneficial uses throughout the Potomac River basin. Withdrawals that are large enough to meet state-specific thresholds are required to be reported to the designated state agency. To date, there is only limited sharing of withdrawal data between states, inhibiting the ability to evaluate water use impacts across state lines. Alignment of state water withdrawal data collection efforts in the Potomac basin may facilitate interstate evaluation of water uses, preliminary estimations of consumptive use, and comparisons of water use to water availability by basin jurisdictions. The Interstate Commission on the Potomac River Basin (ICPRB) has the unique capability to act at the basin-wide scale and is, therefore, well-situated to promote consistent water withdrawal data collection and encourage proactive interstate water use planning and analysis.

A primary benefit of consistent basin-wide data is the ability to compile the data into a single water withdrawal database, enabling easy access for timely analyses. In two recent projects (U.S. Army Corps of Engineers et al. 2013 and Ducnuigee et al. 2015), Potomac basin-wide withdrawal databases were used to estimate water withdrawals in select watersheds. The Middle Potomac River Watershed Assessment (U.S. Army Corps of Engineers et al. 2013) utilized a basin-wide database of water withdrawals from the year 2005 to simulate streamflows at numerous ungaged locations throughout the Potomac basin. The CO-OP withdrawal and consumptive use database (Ducnuigee et al. 2015) accounts for water withdrawals and estimates consumptive use for the Potomac basin above Little Falls. Through these projects and in communication with state collaborators, the benefit of a regularly maintained basin-wide withdrawal database was demonstrated and areas for alignment of state water withdrawal data were identified.

The purpose of this document is to evaluate the efficacy of Potomac basin state water withdrawal data for a basin-wide database and to recommend adjustments to state data collection efforts that would facilitate the development of a basin-wide database. This document begins by describing the water withdrawal data collected in each of the basin jurisdictions, the legislation granting the authority, and the associated withdrawal data reporting requirements. Basin jurisdictions included in this evaluation are Maryland, Pennsylvania, West Virginia, and Virginia. Although water used in the District of Columbia comes from the Potomac River, it is purchased from Washington Aqueduct and does not require additional withdrawal permits or reporting.

To assist in identifying strengths and weaknesses of the state data for a Potomac basin-wide withdrawal database, descriptions of the similarities and differences between the state data sets are provided. Useful data elements for a basin-wide water withdrawal database are also provided based on past experience and in communication with state agencies. These data elements may enhance the compilation of the diverse state data sets into a common database.

Finally, recommendations are made for aligning water withdrawal data collection efforts, a necessary step in the development of a basin-wide water withdrawal database and in conducting interstate water use analyses. The recommendations illustrate how the data currently collected in each basin jurisdiction might be altered to complement the other states' data.

## State Data

State regulations define water withdrawal registration and reporting requirements. Generally, all states record the name, location, and contact information for the water withdrawals. Each state assigns a unique numeric or alphanumeric identifier for withdrawal points based on the permit, facility, or withdrawal location (or a combination of these). The withdrawal point also receives a descriptive identifier to distinguish it from other sources operated by the same owner. Beyond this basic information, each state collects and records additional withdrawal information that may be important to a basin-wide database, discussed in the next sections by state. The state-specific descriptions are based on the withdrawal regulations, permit application forms (**Appendix A**), withdrawal reporting forms (**Appendix B**), actual withdrawal data provided by the states, and data collected by the states during the application approval process. Comparison tables of the state collected data are provided in **Appendix C**.

### Maryland

Maryland law (Annotated Code of Maryland, Environment Article, § 5-501 thru § 5-5B-05) and regulations (COMAR 26.17.06) require appropriators of water, with some exceptions, to obtain a permit or file for a permit exemption for the appropriation of surface- or ground-water. Under this regulation, semiannual reporting of monthly water use is required by persons with non-agricultural withdrawal permits for annual average withdrawals of 10,000 gallons per day (gpd) or more. Agricultural withdrawal permits for annual average withdrawals of 10,000 gpd or more may require annual reporting of monthly water use.

Maryland Department of the Environment (MDE) is tasked with collecting water withdrawal information in Maryland. In addition to general registration information, MDE collects information about each withdrawal location including the water source (groundwater, surface water, or spring), the type of water (fresh or saline), the aquifer or stream name, up to four use types (e.g. agriculture, industry, etc.) and the percentage of the total withdrawal for each use, the monthly withdrawal amount (gal), the method used to determine the withdrawal amounts (metered or calculated), and the wastewater discharge method. Much of this information is captured on the withdrawal application forms. Other data elements are collected by MDE personnel during subsequent application review procedures. For example, Maryland collects detailed information from agricultural users about the intended water use such as the types of crops grown or types and number of livestock. Maryland withdrawal location data are recorded in MDE's permit system; however, translation to a latitude-longitude coordinate system will be required when the data are combined with other out-of-state data.

### Pennsylvania

Registration and reporting of water withdrawal information is required under Title 25 (Environmental Protection), Chapter 110 (Water Resources Planning) of the Pennsylvania code. Persons withdrawing more than 10,000 gpd averaged over any 30 day period, persons receiving more than 100,000 gpd (or 10,000 gpd in a critical water planning area) in any 30 day period through an interconnection with another person, owners of public water supply agencies, or owners of hydropower facilities are required to register and report the withdrawal to the Pennsylvania Department of Environmental Protection (PADEP).

In addition to the general registration data, PADEP collects information about the intended use for the water, the industry (NAICS) code for the registration holder organization, source type (groundwater well,

one of several surface water body types, or other sources), the potability of the water, location of the withdrawal point, and the method used to determine the location. For surface water sources, the pump capacity and usable storage volume are collected. For groundwater sources, information about the well is recorded including the driller's name and license number, well depth, well diameter, details on the well casing and screen, pump capacity, and position in the well. Information is collected about the measurement of withdrawn water including meter accuracy, size, capacity, meter test information, and volume measurement or calculation method. For public suppliers, PADEP collects information on the population served, the types of metered connections to the system, the number of each type of connection, and the annual total volume of water supplied to each connection type. Pennsylvania collects the monthly withdrawal amount (gal) and the number of days of withdrawal for each month. This reported information facilitates calculation of an accurate average daily withdrawal amount.

## Virginia

Any user that withdraws water in quantities above the established thresholds in Virginia is required to report on an annual basis to the Virginia Department of Environmental Quality (VADEQ) under the Water Withdrawal Reporting Regulation (9 VAC 25-200, et seq.). Withdrawals for crop irrigation (including nurseries and sod farms) must be reported for uses of one million gallons or more in a single month. Such users are not required to report withdrawals from ponds in ephemeral or intermittent streams, unless the ponds intersect the groundwater table and, therefore, withdrawal groundwater. Average daily withdrawals greater than 10,000 gpd during any single month from ground- and/or surface-water in Virginia for all other purposes (e.g. livestock production, mining operations, public water supplies, manufacturing, power production, and golf courses) must be reported.

Under the Water Withdrawal Reporting Regulation, VADEQ collects general registration information about the withdrawal permit holder plus information about the water use types. Public supply applicants estimate the percentage of the withdrawal for human consumptive use. VADEQ also collects from public suppliers the amount of finished water released to another supplier or service system. Groundwater withdrawal applications collect additional information including the well name, location, and construction details. The disposal of any wastewater produced in association with the groundwater withdrawal is reported on the application. System information is reported annually for each withdrawal point as well as the maximum daily withdrawal amount (Mgal), month of maximum withdrawal, and the monthly withdrawal amount (Mgal). A salinity code is recorded for each withdrawal point indicating if the source is fresh or saline. Surface water withdrawal permits obtain additional information such as the surface water body name; intake location; reservoir location; instream flow requirements; and the maximum daily, maximum monthly, and maximum annual withdrawal amounts (Mgal).

## West Virginia

In West Virginia, reporting water withdrawals is required under the Water Resources Protection and Management Act of 2008. Under this legislation, West Virginia's original reporting threshold was 750,000 gal in a calendar month. As of January 2015, the Act was amended by Senate Bill 373 to require registration and reporting by Large Quantity Users, defined as those who withdraw greater than 300,000 gallons in a calendar month (unless the water is purchased from a supplier that reports its total withdrawal). After registering a withdrawal with the West Virginia Department of Environmental Protection (WVDEP), each month's water use must be reported annually to WVDEP. Water designated for farm use is excluded from the reporting requirement.

Water users provide general information about the owner and facility, monthly withdrawal quantity (gal), and the source of the withdrawal. Users can also report optional information on the costs and water savings associated with any water conservation practices implemented in the past five years or planned for the next five years. Water withdrawals greater than 300,000 gal used for hydraulic fracturing of gas wells require reporting using a separate on-line form. Those data are subsequently stored in a separate database. Withdrawal information collected for hydraulic fracturing includes company and water source information, withdrawal amount and dates, the number of wells fractured, the amount of recovered water, and water disposal information (e.g. reuse or underground injection).

## State Summary

Each Potomac basin jurisdiction collects water use data; however, there are differences in the specific data fields and in the registration and reporting requirements. The effects of the similarities and differences in state requirements are visible when evaluating the available data (**Table 1**). For example, public water suppliers comprise 57 percent of all registered uses in Pennsylvania<sup>1</sup>, a greater percentage than any other state in the basin. This may be because Pennsylvania requires all public suppliers to register their withdrawals. West Virginia has the fewest registered uses per area in the basin, a reflection of the original, higher reporting threshold.

**Table 1.** Number of uses by type, from 2005 withdrawal data compiled by ICPRB (District of Columbia has no withdrawal points).

Use Type	MD	PA	VA	WV	Total
Agriculture	141	35	71	4	251
Commercial	64	37	76	12	189
Industrial	18	7	66	18	109
Mining	38	12	11	0	61
Other	4	0	4	5	13
Power	15	2	2	7	26
Public Water Supply	235	125	253	39	652
Total	515	218	483	85	1,301
Area in Basin (sq. mi.)	3,413	1,579	5,664	3,511	14,232

An optimal basin-wide withdrawal database would be built on a strong foundation of compatible data. Subsequent sections of this report document the similarities and differences in the state withdrawal data sets as well as recommendations for aligning differences in key data fields.

## Common State Data Elements

Although there are differences in the specific information recorded, the Potomac basin states collect similar data elements (**Table 2**). Each basin state collects owner and facility data including the owner's name and contact information and withdrawal location information. The intended use of the withdrawn

<sup>1</sup> Based on a basin-wide compilation by ICPRB of 2005 withdrawal data from the states.



water is also collected by each state along with the source types (i.e. surface water, groundwater, or water transfer from a separate supplier). Details of the water source including surface water body name or well with construction details are recorded. Users in each state report the monthly and annual withdrawal amounts for each location.

**Table 2.** Partial list of data elements recorded by each state. “Y” indicates that the state records the specified data element. A blank field indicates the element is not available for that state.

Data Element	MD	PA	VA	WV
Owner identification number		Y	Y	
Owner name	Y	Y	Y	Y
Owner industry classification SIC/NAICS		Y	Y	Y
Withdrawal point unique identifier	Y*	Y	Y	Y
Withdrawal point site name	Y*	Y	Y	Y
Secondary site name		Y		Y
Water use type	Y	Y	Y	Y
Source type	Y	Y	Y	Y
Sub-source type	Y	Y	Y	Y
Withdrawal point latitude	Y	Y	Y	Y
Withdrawal point longitude	Y	Y	Y	Y
State	Y		Y	Y
County	Y		Y	Y
Report year	Y	Y	Y	Y
Monthly withdrawal amount	Y	Y	Y	Y
Total annual withdrawal		Y	Y	Y
Total annual days of use		Y		
Annual average daily withdrawal	Y		Y	

\*Maryland has several name:identifier combinations whose use depends on whether the water is withdrawn from surface or ground water and whether the withdrawal is used for public drinking water.

## Proposed List of Database Elements

A basin-wide water withdrawal database should contain sufficient information to uniquely identify, describe, and locate each withdrawal point, and it should include the withdrawal quantity. A draft list of data elements was developed based on the withdrawal data requirements of the Middle Potomac River Watershed Assessment (U.S. Army Corps of Engineers et al. 2013), the CO-OP withdrawal and consumptive use database and impact assessment tool (Ducnuigee et al. 2015), and other efforts to estimate interstate water use in the Potomac River basin (**Table 3**).

**Table 3.** Draft list of withdrawal data elements for basin-wide database.

<b>Draft Data Elements</b>
Owner name
Owner identification number
Permit number (agency generated)
Industry classification (SIC or NAICS)
Unique site identifier
Withdrawal point name
Withdrawal point unique identifier
Withdrawal point latitude
Withdrawal point longitude
State
County
Watershed (reported by the state)
Water use type (a standard code)
Source type (GW, SW, Transfer)
Transfer source
Source sub-type
Salinity type
Aquifer
Withdrawal volume for each month
Days of withdrawal for each month
Report year
Total annual withdrawal
Annual average daily withdrawal
Method of withdrawal measurement/estimation
Monthly withdrawal units
Annual withdrawal units
Discharge location (if known)
Active/Inactive
Contact person
Contact person details
Processing steps code
Comments

Ultimately, additional information may be desirable. For example, the date the data download occurred and the source of the data may prove useful. If the data download is automated, a record of the data release date may be helpful for database management purposes. Documenting the processing steps applied to each record may assist users in understanding how the state data were converted to the basin-wide database format. Example processing steps may include coordinate or unit translation; determining

un-reported county, state, or watershed identification based on the geographic coordinates; and/or translating the state water use codes to standardized water use codes.

## **Recommendations**

Development of a basin-wide water withdrawal database would include compiling state-collected withdrawal data, providing a mechanism for sharing and comparing water use data as state agencies authorize, and helping the basin jurisdictions assess the interstate impacts of water use activities. Interstate investigations of water use, including the development of the basin-wide water withdrawal database, would benefit from collaboration among the states on data collection activities. The positive effects of such collaboration for all basin states include improved water use permitting, planning, and decision-making. Specific recommendations for aligning Potomac basin data collection efforts are described in this section. Many of the recommendations are especially important when conducting analyses at the sub-basin level.

## **Un-reported Withdrawals**

In each state, withdrawals below the reporting threshold (10,000 gpd) represent unaccounted water use that is not readily included in water resources management programs. Improvements to the accuracy and consistency of estimating unreported withdrawals is an area of potential future interstate collaboration.

Un-reported withdrawals generally occur outside of large population centers and may have significant cumulative impacts, especially in smaller watersheds (Kenny et al. 2009). In a recent water resources assessment for the interstate Marsh and Rock creek watersheds of Pennsylvania and Maryland, approximately 49 percent of all withdrawals during the 1997 to 2010 time period were un-reported (ICPRB 2012). Adams County, Pennsylvania is primarily rural with 52 percent of the land in the county used for agriculture in 2007 (PennDOT 2013 and USDA 2009), the third largest percentage in the state. Self-supplied domestic and unregistered agricultural operations represent the majority of the un-reported withdrawals in the watersheds. On a basin-wide scale, un-reported water withdrawals are a smaller portion of the total water use by volume, less than 10 percent<sup>2</sup>. For this reason, this issue is of particular importance for interstate sub-basin (rather than basin-wide) analyses.

## **Standard Industry Codes**

Recording the industry code of water users in the basin would improve the interstate comparability of water withdrawal data. Currently, all basin states but Maryland record a standard industry code for each registered owner (either SIC or NAICS) to identify the owner's industry. Knowing the industry helps in understanding water use patterns, trends, and use rates. For example, water used for agricultural irrigation displays a different seasonal pattern than water used for irrigation on golf courses. Ideally, an industry code would be collected or generated for all registered owners in the database.

## **Water Use Codes**

Consistent water use codes are important for evaluating water uses by type, estimating consumptive uses, and generating future water use projections. All of the Potomac basin states record a water use type for

---

<sup>2</sup> This estimate is based on USGS 2005 water use data for counties that occur entirely or partially in the Potomac basin.

each permitted withdrawal; however, the states utilize different categories and definitions. To address these differences, an accepted translation method from each state's use codes to a single standard use code definition is required. An example standard use code system is the USGS National Water Use Code (Lane 2007, Appendix 5).

### **Multiple Water Uses per Withdrawal**

Documentation of the multiple water uses for each withdrawal, where applicable, promotes more detailed interstate water use analyses. Maryland and Virginia allow multiple uses to be defined for each withdrawal point, recognizing that water drawn from a single point may be used for several purposes. For example, an industrial user may use water for steam generation, cooling, washing, and/or inclusion in products. Implementing this degree of water use type reporting is desirable for all states but requires modification to existing data collection procedures in Pennsylvania and West Virginia.

### **Days of Withdrawal**

In all basin states, users are required to report the total monthly withdrawal quantities for the report year. In addition, Pennsylvania users report the actual number of days in a month that water is withdrawn. The benefits of including days of withdrawal in a basin-wide water withdrawal database are described below.

If a withdrawal occurs every day of the month, then calculating the daily average withdrawal is simply the total monthly withdrawal divided by the number of days in the month. However, not all withdrawals occur every day. For example, some industrial facilities may close on weekends and some users only withdraw water on a seasonal basis (e.g. a golf course that does not irrigate during the winter months). Further, there may be a transition period from the water-use season to non-water-use season and vice versa when withdrawals only occur in part of the month. When withdrawals do not occur every day of the month, then a more accurate daily average is calculated as the total monthly withdrawal divided by the number of days the withdrawal occurred (rather than the total number of days in the month). To this end, having a record of the number of days of use will enhance analysis capabilities.

### **Source Aquifer**

In the Potomac basin, groundwater is withdrawn from either a confined aquifer in the Coastal Plain or a fractured bedrock aquifer in the rest of the basin. The aquifers have different water quality conditions, geochemical characteristics, capacities, and recharge rates. Accounting for the withdrawals from each aquifer can be vital to proper management of groundwater resources. In the lower Potomac basin, for example, Maryland and Virginia share the water resources in the confined aquifers of the Coastal Plain physiographic province. These confined aquifers extend laterally from roughly southern New Jersey to North Carolina. Excessive withdrawals from a confined aquifer in one state can cause a decline in the available water levels in a neighboring state. Therefore, interstate withdrawal accounting improves holistic management of groundwater resources.

Withdrawal data in Maryland, Pennsylvania, and West Virginia include records of the source aquifer for each groundwater withdrawal; however, each state uses a different aquifer identification scheme. The USGS national aquifer code<sup>3</sup> provides a method for consistently recording aquifer information across

---

<sup>3</sup> National Aquifer Code Reference List, <http://water.usgs.gov/ogw/NatlAqCode-reflist.html>, accessed 6/1/2015.

states boundaries. The USGS code could be adapted or a novel coding scheme could be designed for use in the Potomac basin-wide withdrawal database. Virginia withdrawal data include records of the location and depth information for wells in one of the state's Groundwater Management Areas (GWMAs). An estimate of the source aquifer in Virginia is possible using this information. Consistent reporting of source aquifer information would improve the states' abilities to assess interstate impacts on shared aquifers.

## Data Errors

Any data element relating to a reported withdrawal can have errors. For example, the name of the registered owner can be misspelled, the street address of the facility can be erroneous, or the amount of water used can be entered in incorrect units (e.g. gal versus Mgal). The possible sources of errors are just as numerous including human error in recording the data, equipment error due to improper or delayed calibration, or undetected equipment failure to name a few. Identifying, recording, and minimizing errors will improve interstate water use analyses.

Reducing errors in withdrawal volumes should be an initial focus due to the importance of these values for subsequent analyses. Some of these errors are identified and reported but others are unknown and, therefore, not reported. To assess potential sources of error, the withdrawal database should include, for each location, explanatory information such as the measurement equipment used; calibration information; and when, how, and by whom it was generated.

## Data Availability

In the Potomac basin, only Pennsylvania has withdrawal data readily available on-line. Other states provide data upon request. Ideally, the data would be directly accessible to the basin-wide database without the need for a specific request, but protecting confidentiality is a critical consideration with directly accessible data. Prior to establishing direct access to the state water withdrawal data for the basin-wide database, suitable safeguards would need to be established with each state.

A simpler arrangement might be periodic automatic data transfers from the states to a centralized site, e.g. an ICPRB-maintained site. Formatting, unit translations, and population of the database could then be performed. These data transfers could occur when the state agencies update their databases or, since the data is typically reported to the states on an annual basis, once per year. The combined database would be accessible to the states, a primary purpose of the database. Agreements that describe acceptable data sharing between the states would need to be established including approved purposes and recipients for released data. The states may agree to release their data for use by the other states and organizations such as ICPRB or USGS. Security measures would need to be established to protect the database server and the data from unauthorized access.

## Other Information

The states collect other withdrawal information that may be useful in a basin-wide database. Several examples are provided below. As construction of the database begins and communication with the jurisdictions continues, other information will likely be included with the draft list of withdrawal data elements (**Table 3**).

The location of the discharges associated with reported withdrawals can improve understanding of the water budget, the distribution of water in the watersheds, and the consumptive uses of water. This type of data is collected by some states.

Several specific pieces of metadata would be useful to ensure data accuracy and reliability; specifically, 1) the method of measuring or estimating the reported withdrawal amount and the withdrawal point coordinates and 2) explicit documentation of the withdrawal volume units (e.g. gpd, Mgal/m, or Mgal/y). A metadata file or table will be associated with the database.

## Discussion and Next Steps

The Potomac basin is fortunate to have fully enacted water use reporting legislation in all of the basin states. With minor modifications to state collected data, a high quality, assessment ready basin-wide water withdrawal database can become a reality. Such a database would prove useful for general water use permitting, planning, and decision-making activities including, but not limited to, 1) studies of water use quantities and trends and 2) analyses of potential withdrawal and consumptive use impacts in smaller watershed areas.

As a result of this study, nine recommendations were developed to enhance the compatibility of reported water use data; namely, estimating un-reported withdrawals, using standard industry and water use codes, maintaining records of the multiple water uses per withdrawal, recording the days of withdrawal, identifying the source aquifer, identifying and minimizing data errors, developing a mechanism to ensure data availability, and including other information as deemed necessary.

Before proceeding with the development of a basin-wide water withdrawal database, it will be necessary to obtain continued agreement by the states that such a database is beneficial and that development should proceed. Successful creation of the database would then benefit from the series of activities listed below.

- Redistribute the list of possible database fields to the states for their review, with the ultimate goal of agreeing on a list of key data elements for the database.
- Select standard dictionaries for water use categories, industry codes, and aquifer codes along with the necessary translations to produce the standardized codes from available data.
- Establish the necessary security measures to protect the state data servers and the database server and develop the access requirements to the data itself.
- Adjust state reporting requirements as necessary to generate key data elements.
- Design the initial database structure and populate it with state data.
- Periodically update the database with new data through state-specific transfer arrangements.

The water resources in the Potomac basin are a shared resource that are best managed in a collaborative manner by all the states in the basin. Aligning withdrawal data collection efforts across the Potomac basin could have numerous positive benefits for the basin states, towards sustainable management of the interstate water resources.

## References

Ducnuigeen, J., S.N. Ahmed, K.R. Bencala, H.L.N. Moltz, A. Nagel, and C.L. Schultz. 2015. Geospatial analysis tool for estimating watershed-scale consumptive use: Potomac River basin case study. *Chapter In Advances in Watershed Science and Assessment*. Springer International Publishing Switzerland. T. Younos and T.E. Parece (eds.). 141-169.

ICPRB. 2012. Critical Area Resource Plan Marsh and Rock creek watersheds, Adams County, Pennsylvania. Prepared for PADEP. 308p.

Kenny, J.F., N.L. Barber, S.S. Hutson, K.S. Linsey, J.K. Lovelace, and M.A. Maupin. 2009. Estimated use of water in the United States in 2005: USGS Circular 1344. 52 p.

Lane, R.C. 2007. Guidelines for coding and entering ground-water data into the ground-water site inventory database version 4.6, USGS, Washington Water Science Center: Open-File Report 2006-1371. 104 p.

PennDOT. 2013. Pennsylvania County Boundaries. Bureau of Planning and Research, Cartographic Information Division.  
[http://www.pasda.psu.edu/uci/MetadataDisplay.aspx?entry=PASDA&file=PaCounty2013\\_02.xml&dataset=24](http://www.pasda.psu.edu/uci/MetadataDisplay.aspx?entry=PASDA&file=PaCounty2013_02.xml&dataset=24), accessed 6/1/2015.

U.S. Army Corps of Engineers, The Nature Conservancy, and Interstate Commission on the Potomac River Basin. 2013. Middle Potomac River watershed assessment: Potomac River sustainable flow and water resources analysis. Final report. 140p. and 10 appendices.

USDA. 2009. Census of Agriculture, 2007 Census Volume 1, Chapter 1: State Level Data, Pennsylvania, Table 1.  
[http://www.agcensus.usda.gov/Publications/2007/Full\\_Report/Volume\\_1,\\_Chapter\\_1\\_State\\_Level/Pennsylvania/](http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_1_State_Level/Pennsylvania/), accessed 6/1/2015.

## **Appendix A**

### **State permit application forms**

State water withdrawal permit application forms are included below to document the types of data collected. The forms are provided for information purposes only and are not intended to be used for permit application purposes. Please contact the state directly if interested in applying for a water withdrawal permit.

#### **Maryland**

Maryland forms were downloaded from MDE's Water Appropriation or Use Permit Applications and Forms web page:

[http://www.mde.state.md.us/programs/Water/Water\\_Supply/Pages/wapformsandapps.aspx](http://www.mde.state.md.us/programs/Water/Water_Supply/Pages/wapformsandapps.aspx), accessed 5/28/2015.



## MARYLAND DEPARTMENT OF THE ENVIRONMENT

Water Management Administration – Water Supply Program

1800 Washington Blvd, Baltimore MD 21230

410-537-3590 \* 1-800-633-6101 \* fax 410-537-3157

### APPLICATION TO APPROPRIATE AND USE WATERS OF THE STATE

Apply online at: [www.mde.maryland.gov/wsips](http://www.mde.maryland.gov/wsips)

Type of Application	<input type="checkbox"/> New	<input type="checkbox"/> Renewal	<input type="checkbox"/> Modification	Existing Permit Number:	
<b>APPLICANT INFORMATION (PERSON TO WHOM PERMIT WILL BE ISSUED)</b>					
Business Name:					
Contact Name:					
Mailing address:					
City:		State:		ZIP Code:	
Phone:	Mobile:	Fax:	Email:		
Is the applicant the: <input type="checkbox"/> Water User <input type="checkbox"/> Land Owner <input type="checkbox"/> Both					
Permit is to be issued to <input type="checkbox"/> Individual <input type="checkbox"/> Business					
<b>LAND/PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)</b>					
Name:					
Mailing Address:					
City:		State:		ZIP Code:	
Phone:	Mobile:	Fax:	Email:		
<b>CONSULTANT OR OTHER CONTACT INFORMATION</b>					
Name:					
Mailing Address:					
City:		State:		ZIP Code:	
Phone:	Mobile:	Fax:	Email:		
<b>REQUESTED APPROPRIATION OR USE</b>					
Avg. daily use in gallons (total annual use/365)		Surface Water:		Groundwater:	
Groundwater - Avg. during month of maximum use in gallons(highest month/30):					
Surface water - Maximum daily use in gallons (highest day of year):					
<b>HOW WILL THE WATER BE USED? (Please check all that apply and describe)</b>					
<input type="checkbox"/> Community Water Supply	PWSID:	Pop. served:	No. of connections:		
<input type="checkbox"/> Potable Water Supply	No. of connections:				
<input type="checkbox"/> Commercial/Institutional	No. regular customers:		Sq. footage:		
	Type/Name of business:				
<input type="checkbox"/> Subdivision on indiv. wells	No. of lots (based on full buildout):				
<input type="checkbox"/> Industrial/Mining	Describe uses:				

<input type="checkbox"/> Power Generation	Describe uses
<input type="checkbox"/> Non-agricultural irrigation	No. of acres:
<input type="checkbox"/> Other (describe)	
<b>LOCATION OF WITHDRAWAL (<i>Attach additional sheets if necessary</i>)</b>	
Street address and/or location description:	
Subdivision/Town	County:
Tax map/grid/parcel/lot:	Lat/Long:
Please attach a map of the existing and proposed water withdrawal locations (wells, ponds, streams, etc).	
<i>All applications must include location map. Subdivision applications must include plat.</i>	

<b>SURFACE WATER SOURCE</b>				
Source (check all that apply) <input type="checkbox"/> Stream/River <input type="checkbox"/> Lake <input type="checkbox"/> Pond <input type="checkbox"/> Bay				
Name of source:			Location of intake:	
<b>GROUNDWATER WATER SOURCE(S) (<i>Attach additional sheets if necessary</i>)</b>				
Source (check all that apply) <input type="checkbox"/> Well <input type="checkbox"/> Spring <input type="checkbox"/> Groundwater Pond <input type="checkbox"/> Other(describe)				
Total no. of wells:	No. of new wells:	No. of existing wells (not abandoned):		
Well tag number	Well name/description	Depth (ft)	Diameter (inches)	
				<input type="checkbox"/> New <input type="checkbox"/> Existing
				<input type="checkbox"/> New <input type="checkbox"/> Existing
				<input type="checkbox"/> New <input type="checkbox"/> Existing
				<input type="checkbox"/> New <input type="checkbox"/> Existing
				<input type="checkbox"/> New <input type="checkbox"/> Existing
<b>WASTEWATER DISPOSAL (<i>check one</i>)</b>				
<input type="checkbox"/> Public Sewer		<input type="checkbox"/> Groundwater Spray irrigation		
<input type="checkbox"/> Groundwater Subsurface (tilefield, seepage pit, etc)		<input type="checkbox"/> Groundwater Other (please explain):		
<input type="checkbox"/> Surface water	Name of stream:			
DISCHARGE PERMIT NUMBER:				
<b>CONSERVATION EASEMENTS</b>				
Is there a conservation easement on any part or all of this property? <input type="checkbox"/> Yes <input type="checkbox"/> No				
If yes, who holds the easement?				
Have you notified the holder of the easement of your intent to use the water? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A				
<b>PRIVACY NOTIFICATION</b>				

This Notice is provided pursuant to § 10-624 of the State Government Article of the Maryland Code. The personal information requested on this form is intended to be used in processing your application. Failure to provide the information requested may result in your application not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment ("MDE") is a public agency and subject to the Maryland Public Information Act. This form and the information provided on this form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by federal or State law.

### **SIGNATURE**

I certify and affirm under penalty of perjury that all of the information I am providing on this date is complete, true and accurate to the best of my knowledge. I am aware that submitting false, inaccurate or incomplete information may result in the denial or revocation of the permit, or be subject to any other sanctions allowed under Maryland Law.

Signature of Applicant:

Name(please print):

Title:

Date:

### **REVIEW BY COUNTY ENVIRONMENTAL HEALTH OR DESIGNATED AGENCY**

*This section is required only for NEW and MODIFIED applications - Not required for renewals*

*This section not to be completed by applicant*

Is project consistent with county water and sewer plan and local planning and zoning?

☐ Yes ☐ No (explain)

Signature of county representative:

Title:

Date:

# MARYLAND DEPARTMENT OF THE ENVIRONMENT

Water Management Administration – Water Supply Program

1800 Washington Blvd, Baltimore MD 21230

410-537-3590 \* 1-800-633-6101 \* fax 410-537-3157

## APPLICATION TO APPROPRIATE AND USE WATERS OF THE STATE FOR AGRICULTURAL PURPOSES

Apply online at: [www.mde.maryland.gov/wsips](http://www.mde.maryland.gov/wsips)

Type of Application	<input type="checkbox"/> New	<input type="checkbox"/> Renewal	<input type="checkbox"/> Modification	Existing Permit Number:	
<input type="checkbox"/> Required Permit (10,000 gallons per day or more averaged over a year)					
<input type="checkbox"/> Voluntary Permit (less than 10,000 gallons per day averaged over a year)					
<b>APPLICANT INFORMATION (Person/Entity to whom permit will be issued)</b>					
Name:			Farm Name:		
Contact name:					
Mailing address:					
City:		State:		Zip Code:	
Phone:		Mobile:		Fax:	
Email:					
Is the applicant the: <input type="checkbox"/> Water User <input type="checkbox"/> Land Owner <input type="checkbox"/> Both					
If applicant is the water user, is this a lease agreement? <input type="checkbox"/> Yes <input type="checkbox"/> No Lease ends (year):					
If applicant is the land owner, will the land be leased to another person/entity? <input type="checkbox"/> Yes <input type="checkbox"/> No Lease ends (year):					
Permit is to be issued to <input type="checkbox"/> Individual <input type="checkbox"/> Business					
<b>LAND/PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)</b>					
Name:					
Mailing Address:					
City:		State:		ZIP Code:	
Home Phone:		Work Phone:		Cell Phone:	
Fax:		Email:			
<b>WATER USE (Please check all that apply; attach additional sheets if necessary)</b>					
<input type="checkbox"/> Field crop irrigation			Total number of irrigated acres:		
Crop type:		Number of irrigated acres:		Type of irrigation system:	
Crop yield goal:					
Do you practice double-cropping? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, indicate crops:					
<input type="checkbox"/> Vegetable irrigation		Type(s) of vegetables:			
		Number of irrigated acres:			
<input type="checkbox"/> Livestock watering		Number and type:			

<input type="checkbox"/> Poultry watering		Type of poultry:		Number of houses:	
		Number of birds/flock:		Number of flocks/yr:	
Cooling system <input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Evaporative cooling pad		<input type="checkbox"/> Fogger	
<input type="checkbox"/> Aquaculture					
<input type="checkbox"/> Horticultural operation		Type:			
<input type="checkbox"/> Other (Specify)					
<b>LOCATION OF WITHDRAWAL (Attach additional sheets if necessary)</b>					
Street address and/or location description:					
Town/City				County	
Tax map/grid/parcel/lot:				Lat/long:	
Subdivision/town:				Phone:	
Lat/Long:					
Please attach a map of existing and proposed water withdrawal locations (wells, ponds, streams, etc.)					
Please attach a map of the proposed irrigation layout.					
<b>GROUNDWATER SOURCE(S) (Attach additional sheets if necessary)</b>					
Source (check all that apply) <input type="checkbox"/> Well <input type="checkbox"/> Spring <input type="checkbox"/> Groundwater Pond <input type="checkbox"/> Other (describe)					
Total no. of wells:		No. of new wells:		No. of existing wells (not abandoned):	
Well tag number		Well name/description		Depth (ft)	
				Diameter (inches)	
				<input type="checkbox"/> New <input type="checkbox"/> Existing	
				<input type="checkbox"/> New <input type="checkbox"/> Existing	
				<input type="checkbox"/> New <input type="checkbox"/> Existing	
				<input type="checkbox"/> New <input type="checkbox"/> Existing	
				<input type="checkbox"/> New <input type="checkbox"/> Existing	
				<input type="checkbox"/> New <input type="checkbox"/> Existing	
If groundwater pond, depth of pond (feet):					
Please attach any information from boreholes, test well(s), and/or aquifer tests					
<b>SURFACE WATER SOURCE</b>					
Source (check all that apply) <input type="checkbox"/> Stream/River <input type="checkbox"/> Lake <input type="checkbox"/> Pond <input type="checkbox"/> Bay					
Name of source:					
Location of intake:					
Is the intake located on property owned by the applicant? <input type="checkbox"/> Yes <input type="checkbox"/> No					
<b>CONSERVATION EASEMENTS</b>					
Is there a conservation easement on this property? <input type="checkbox"/> Yes <input type="checkbox"/> No					
If yes, who holds the easement?					
Have you notified the holder of the easement of your intent to use the water? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A					
<b>PRIVACY NOTIFICATION</b>					

This Notice is provided pursuant to § 10-624 of the State Government Article of the Maryland Code. The personal information requested on this form is intended to be used in processing your application. Failure to provide the information requested may result in your application not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment ("MDE") is a public agency and subject to the Maryland Public Information Act. This form and the information provided on this form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by federal or State law.

### **SIGNATURE**

I certify and affirm under penalty of perjury that all of the information I am providing on this date is complete, true and accurate to the best of my knowledge. I am aware that submitting false, inaccurate or incomplete information may result in the denial or revocation of the permit, or be subject to any other sanctions allowed under Maryland Law.

Signature of Applicant:

Name (please print):

Title:

Date:

**Please use additional sheets of paper if needed to complete this application**

## MARYLAND DEPARTMENT OF THE ENVIRONMENT

Water Management Administration – Water Supply Program  
1800 Washington Blvd, Baltimore MD 21230  
410-537-3590 \* 1-800-633-6101 \* fax 410-537-3157

### NOTICE OF EXEMPTION TO APPROPRIATE AND USE GROUNDWATER

Apply online at: [www.mde.maryland.gov/wsips](http://www.mde.maryland.gov/wsips)

<b>New Exemptions Only</b> Please see p. 2 if you are unsure whether you are eligible for an exemption.		
<b>PRIVACY NOTIFICATION</b>		
This Notice is provided pursuant to § 10-624 of the State Government Article of the Maryland Code. The personal information requested on this form is intended to be used in processing your application. Failure to provide the information requested may result in your application not being processed. You have the right to inspect, amend, or correct this form. The Maryland Department of the Environment ("MDE") is a public agency and subject to the Maryland Public Information Act. This form and the information provided on this form may be made available on the Internet via MDE's website and is subject to inspection or copying, in whole or in part, by the public and other governmental agencies, if not protected by federal or State law.		
<b>APPLICANT INFORMATION</b>		
Name:		
Mailing address:		
City:	State:	ZIP Code:
Phone:	Fax:	Email:
<b>GROUNDWATER QUANTITY TO BE USED</b>		<b>GROUNDWATER SOURCES</b>
Avg. gallons per day (total annual use/365):	Check all that apply: <input type="checkbox"/> Well <input type="checkbox"/> Spring <input type="checkbox"/> Groundwater Pond <input type="checkbox"/> Other _____	
Gallons per day during month of maximum use:	No. of wells:	New: <input type="checkbox"/> Yes <input type="checkbox"/> No
Well tag number(s):		
Do you have any other water appropriation permits on this site? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Do you use water from another water source on this site? <input type="checkbox"/> Yes <input type="checkbox"/> No		
<b>HOW WILL THE WATER BE USED? (Please check all that apply and describe)</b>		
<input type="checkbox"/> Non-agricultural irrigation	No. of acres:	Hrs. per day:
<input type="checkbox"/> Industrial process water	<input type="checkbox"/> Contact <input type="checkbox"/> Non-contact	
<input type="checkbox"/> Potable water supply	No. of consumers:	
<input type="checkbox"/> Commercial/Institutional	Sq. footage:	No. regular consumers:
<input type="checkbox"/> Subdivision on indiv. wells	No. of lots (based on full buildout):	
<input type="checkbox"/> Other (describe)		
<b>LOCATION OF WITHDRAWAL (Attach additional sheets if necessary)</b>		
The proposed withdrawal will occur in a water management strategy area (see p.3) <input type="checkbox"/> Yes <input type="checkbox"/> No		
Street address and/or location description:		
Town:	County:	Tax map/grid/parcel/lot:
<b>Signature</b>		
I certify and affirm under penalty of perjury that all of the information I am providing on this date is complete, true and accurate to the best of my knowledge. I am aware that submitting false, inaccurate or incomplete information may result in the denial or revocation of the permit or exemption, or be subject to any other sanctions allowed under Maryland Law.		
Signature of Applicant:		
Name (please print):		

Updated 011/05/2014

<b>DETERMINE WHETHER YOU ARE ELIGIBLE FOR AN EXEMPTION</b>		
Answer the questions below, continuing to the bottom of the form until you are instructed to stop or eligibility is confirmed. If the form indicates that a <b>permit is required</b> , you must complete an application for a permit. If the form indicates that a <b>permit is not required</b> , you do not need a permit or an exemption for your water use.		
Will you use a surface water source?	<input type="checkbox"/> Yes Stop! Permit is required	<input type="checkbox"/> No
Is your desired water use agricultural and less than an annual average of 10,000 gallons per day?	<input type="checkbox"/> Yes Stop! Permit/Exemption <b>not</b> required You may apply for a voluntary permit	<input type="checkbox"/> No
Is your designed water use for domestic use other than heating or cooling, and on one individual lot?	<input type="checkbox"/> Yes Stop! Permit/Exemption <b>not</b> required	<input type="checkbox"/> No
Is your desired use for extinguishing a fire?	<input type="checkbox"/> Yes Stop! Permit/Exemption <b>not</b> required	<input type="checkbox"/> No
Is your desired use for dewatering during construction lasting less than 30 days (including days of non-pumping), and using less than 10,000 gallons per day?	<input type="checkbox"/> Yes Stop Permit/Exemption <b>not</b> required	<input type="checkbox"/> No
Will your ground water use exceed 5,000 gallons per day as an annual average?	<input type="checkbox"/> Yes Stop! Permit is required	<input type="checkbox"/> No
Is your desired water use within a Water Management Strategy Area <sup>1</sup> target aquifer?	<input type="checkbox"/> Yes Stop! Permit is required	<input type="checkbox"/> No
Is your desired water use associated with subdividing land into residential lots on individual wells?	<input type="checkbox"/> Yes You may be eligible for an exemption <sup>2</sup>	<input type="checkbox"/> No
Is your desired water use for a drinking water system that serves at least 15 service connections used by year-round residents <sup>3</sup> or regularly at least 25 year-round residents?	<input type="checkbox"/> Yes Stop! Permit is required	<input type="checkbox"/> No
Did you answer NO to all questions above?	<input type="checkbox"/> Yes You are eligible to file a Notice of Exemption. Proceed with the form on the first page.	

<sup>1</sup> To determine whether your location is within a Water Management Strategy Area, please visit MDE's website at [http://www.mde.state.md.us/programs/Water/Water\\_Supply/Pages/WaterManagementStrategyAreas.aspx](http://www.mde.state.md.us/programs/Water/Water_Supply/Pages/WaterManagementStrategyAreas.aspx)

<sup>2</sup> Please submit a location map and plan of the proposed subdivision for MDE review. MDE will determine whether a permit is required or a Notice of Exemption may be filed and will notify you if a permit application is required.

<sup>3</sup> *Year-round resident* means an individual whose primary residence is served by the water system. The individual need not live at the residence 365 days a year for it to be considered their year-round residence.



## Pennsylvania

The PADEP application for water allocation is available in "Water Allocation and Application Instructions.pdf" on the PADEP web site at <http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-9484>, accessed 6/2/2015. The document contains detailed instructions and the application form pages. The application form pages are provided for reference below.

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WATERSHED CONSERVATION

**Before completing this form,  
read the step-by-step instructions  
provided with this Permit form.**

Application ID# (Assigned by DEP) \_\_\_\_\_  
Stamp Date Application Received

**Applicant Name:**

For public water supply agencies where a municipal authority and a municipality are involved jointly in the financing, operation and maintenance of the water system, describe the relationship of the municipal authority to the municipality and the respective duties and functions of each entity.

Name of Source <sup>1</sup>	Quantity of Allocation Requested (gpd)	Type <sup>2</sup>	Safe Yield <sup>3</sup> (gpd)	Location of Taking Point (latitude/longitude)
TOTAL				XXXXXXXXXXXXXXXXXXXX

<sup>3</sup> Provide method of computation.



**SECTION F. EXISTING SOURCES, INCLUDING WELLS:**

Name of Source	Average Daily Withdrawal <sup>1</sup> (gpd)	Days Use During Calendar Year	Safe Yield <sup>2</sup> ( d/ d)	Wells		Type of Use <sup>3</sup>	Location of Taking Point (latitude/longitude)	Is Withdrawal from Source Metered? (Yes / No)	
				Depth (ft)	Diameter (in)				
								<input type="checkbox"/> Yes	<input type="checkbox"/> No
								<input type="checkbox"/> Yes	<input type="checkbox"/> No
								<input type="checkbox"/> Yes	<input type="checkbox"/> No
								<input type="checkbox"/> Yes	<input type="checkbox"/> No
								<input type="checkbox"/> Yes	<input type="checkbox"/> No
								<input type="checkbox"/> Yes	<input type="checkbox"/> No
								<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>TOTAL</b>				<b>XXXX</b>	<b>XXXX</b>	<b>XXX</b>	<b>XXXXXXXXXXXX</b>	<b>XXXXXXXXXXXX</b>	

<sup>1</sup> Provide as an attachment monthly Daily Water Withdrawal Reports for the most recent two calendar years.<sup>2</sup> Provide method of computation or submit copies of test data.<sup>3</sup> Indicate if source is used on Regular-R, Auxiliary-A, or Emergency-E basis.**SECTION G. INTERCONNECTIONS WITH OTHER PUBLIC WATER SUPPLIERS:<sup>1</sup>****a. List each interconnection with other public suppliers. (Mark with an "M" if metered and an "E" if for emergency use)**

Name of Supplier	Average Quantity of Water Transferred (gpd)				Maximum Transfer Limit per Agreement (gpd)		Maximum Hydraulic Transfer Capability (gpd)	
	From Applicant		To Applicant		From Applicant	To Applicant	From Applicant	To Applicant
	Quantity	Days	Quantity	Days				
<b>TOTAL</b>		<b>XX</b>		<b>XX</b>	<b>XXXXXXXX</b>	<b>XXXXXXXX</b>		

<sup>1</sup> Provide for each interconnection with other public water suppliers, both existing and proposed, a copy of the current agreement governing the transfer of water.**b. Provide as an attachment the most recent two calendar-year history for each interconnection listed above, showing the date of meter reading and gallons transferred**

SECTION H. INSTREAM INTAKES EXCLUDING DAMS (existing and/or proposed)								
Name of Stream	Location (latitude/longitude)		Drainage Area ( sq mi )					

SECTION I. RAW WATER INTAKE DAMS AND STORAGE DAMS: <sup>1</sup> (existing and/or proposed)								
Name of Stream	Year Built	Year Last Sedimentation Survey	Location (latitude/longitude)	Storage Capacity (mg)	Surface Area (acres)	Drainage Area (sq mi)	Release Works <sup>2</sup>	
							Yes	No
							<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>
							<input type="checkbox"/>	<input type="checkbox"/>

<sup>1</sup> Include reservoir elevation-area-capacity curve for each dam as an attachment to this application.

<sup>2</sup> Does the dam have facilities to provide a release of water to the stream when water is not flowing over the spillway or top of dam? If yes, describe length, diameter, depth, valving, etc.

SECTION J. WATER TREATMENT PLANTS INCLUDING CHLORINATION FACILITIES (MARK WITH A "C"):					
Name	Location (latitude/longitude)	Design Capacity (gpd)	Permitted Capacity (gpd)	Average Daily Quantity Treated (gpd)	Average Daily Hours Operated (hrs)
Will present treatment plant(s) be expanded or a new plant constructed? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, has application been made for a public water supply permit? Yes <input type="checkbox"/> No <input type="checkbox"/> Date of application _____					
SECTION K. TREATED STORAGE RESERVOIRS, STANDPIPES OR TANKS (existing "E" and/or proposed "P")					
Name	Location (latitude/longitude)	Type of Construction	Storage Capacity (gallons)	Is Reservoir Covered?	
				Yes	No
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>
TOTAL	XXXXXXXXXXXXXX	XXXXXXXXXXXXXX	-	XXX	XXX

SECTION L. DISPOSAL OF WASTEWATER RESULTING FROM THE WATER SUPPLY PROVIDED TO THE SERVICE AREA:			
a. Wastewater treatment plants:			
Name of Sewage Treatment Plant	Amount Treated from Service Area (gpd) <sup>1</sup>	Percent of Total Use	Name of Receiving Stream
SUBTOTAL			
b. On-site disposal:			
c. Other (See instructions):			
TOTAL		100.00	XXXXXXXXXXXXXXXXXXXXXXXXXXXX
<sup>1</sup> Total for column should approximate the Average Day for the most recent calendar year reported in Section N.			





**SECTION N. QUANTITY OF WATER**

Quantity of water supplied in each of the past 10 calendar years: (If less than 10 years of data or no peak day is available, provide an explanation why it is not available)

Year	Average Day (gallons)		Peak Day (gallons)		Peak/Average Ratio
	metered <input type="checkbox"/>	estimated <input type="checkbox"/>	metered <input type="checkbox"/>	estimated <input type="checkbox"/>	

**SECTION O. WATER USE FOR MOST RECENT CALENDAR YEAR LISTED ABOVE:**

Type Use	Metered Connections		Nonmetered Connections	
	Number	Water Use (gpd)	Number	Water Use (gpd)
Domestic				
Commercial				
Industrial				
Institutional				
Bulk Sales to Other Suppliers				
Municipal (Identify Below)				
Other (Identify Below)				
Leakage and Loss				
<b>TOTALS</b>				

Identification of Municipal Uses: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Identification of Other Uses: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**SECTION P. NAMES AND ADDRESSES OF PUBLIC WATER SUPPLY AGENCIES**

Provide the names and addresses of public water supply agencies or other users downstream of the source(s) which may be affected by the present or proposed acquisition(s).

Provide the names and addresses of public water supply agencies or other users upstream of the source(s) which may affect the present or proposed acquisition(s).

**SECTION X. OVERALL SYSTEM MAP (PLEASE READ INSTRUCTIONS FOR THIS SECTION)**

This application must be accompanied by an overall system map on 7.5 minute series USGS Quadrangle maps showing the locations of the present and proposed surface and groundwater sources of supply, including and labeling all pumping stations, purification and/or filter plants, reservoirs, wells, springs, booster stations, standpipes, transmission mains and interconnections with other suppliers, and an outline of the present and proposed future service area. The map must also show service areas of wastewater treatment plants, their points of discharge, and a delineation of areas served by on-lot septic systems, if applicable.

**SECTION Y. CERTIFICATE AND SIGNATURE****AFFIDAVIT**

Commonwealth of Pennsylvania, County Of \_\_\_\_\_

I, \_\_\_\_\_, being duly sworn, according to law, depose and say that I (am the applicant) (am an officer or official of the applicant) (have the authority to make this application) and that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief.

Sworn and Subscribed to before me this

\_\_\_\_\_ Day Of \_\_\_\_\_ 19 \_\_\_\_\_

\_\_\_\_\_  
SIGNATURE OF RESPONSIBLE OFFICIAL

\_\_\_\_\_  
NOTARY PUBLIC

THE SECTION BELOW IS TO BE COMPLETED BY THE ENGINEER AUTHORIZED BY THE APPLICANT TO PREPARE THIS APPLICATION

Name of Engineer and Firm			<b>ENGINEER'S</b>  <b>SEAL</b>
Mailing Address			
Telephone Number	Fax Number	E-mail Address	

## Virginia

The applications for surface water withdrawals in Virginia include the standard Joint Permit Application (JPA), the VADEQ Application for New or Expanded Minor Surface Water Withdrawals, and the tidewater JPA in the tidal portions of Virginia. A potential water user selects and submits the application appropriate for the intended withdrawal. Electronic versions of these forms are available on the VADEQ Permits, Fees, and Regulations web page

(<http://www.deq.virginia.gov/Programs/Water/WetlandsStreams/Permits.aspx>, accessed 6/2/2015).

Applications for groundwater withdrawals are made using a separate form, available from VADEQ (<http://www.deq.state.va.us/Programs/Water/WaterSupplyWaterQuantity/GroundwaterPermitting/Documents,FormsandAdditionalResources.aspx>, accessed 6/2/2015). Portions of these applications are provided below for reference.

a) Pages of the VADEQ JPA pertinent to surface water withdrawals.

PLEASE PRINT OR TYPE ALL ANSWERS. If a question does not apply to your project, please print N/A (not applicable) in the space provided. *If additional space is needed, attach extra 8 1/2 x 11 inch sheets of paper.*

<b><u>CHECK ONE, if applicable:</u></b>	Pre-Construction Notification (PCN) <input type="checkbox"/> (For Nationwide Permits ONLY)	SPGP <input type="checkbox"/>
---	---	-------------------------------

<b>1. PROJECT LOCATION INFORMATION</b> (Attach a copy of a detailed map, such as a USGS topographic map or street map showing the site location and project boundary, so that it may be located for inspection. Include an arrow indicating the north direction.)	
Street Address	City/County/Zipcode
Subdivision	Lot/Block/Parcel #
Name of water body(ies) within project boundaries and drainage area (acres or square miles)	
Tributary(ies) to: _____ Basin: _____ Subbasin: _____ (Example: Basin: <u>James River</u> Subbasin: <u>Middle James River</u> )	
Special Standards (based on DEQ Water Quality Standards 9VAC25-260 et seq.): _____	
Project type (check one) _____ Single user (private, non-commercial, residential) _____ Multi-user (community, commercial, industrial, government)	
Latitude and longitude at center of project site: _____ / _____ - _____	
USGS topographic map name: _____	
8- digit USGS Hydrologic Unit Code (HUC) for your project site (See <a href="http://cfpub.epa.gov/surf/locate/index.cfm">http://cfpub.epa.gov/surf/locate/index.cfm</a> ): _____ If known, indicate the 10-digit and 12-digit USGS HUCs (see <a href="http://dswcapps.dcr.virginia.gov/htdocs/maps/HUEXplorer.htm">http://dswcapps.dcr.virginia.gov/htdocs/maps/HUEXplorer.htm</a> ): _____	
Name of your project (Example: <u>Water Creek driveway crossing</u> ) _____	
Is there an access road to the project? ___ Yes ___ No. If yes, check all that apply: ___ public ___ private ___ improved ___ unimproved	
Provide driving directions to your site, giving distances from the best and nearest visible landmarks or major intersections:   	
Does your project site cross boundaries of two or more localities (i.e. cities/counties/towns)? ___ Yes ___ No If so, name those localities: _____	

FOR AGENCY USE ONLY	
	Notes:
JPA#	

**2. APPLICANT, AGENT, PROPERTY OWNER, AND CONTRACTOR INFORMATION**  
The applicant(s) is/are the legal entity to which the permit may be issued. The applicant(s) can either be the property owner(s) or the person/people/company(ies) that intend(s) to undertake the activity. The agent is the person or company that is representing the applicant(s). If a company, please use the company name that is registered with the State Corporation Commission (SCC), or indicate no registration with the SCC.

Applicant(s) (For a company, use SCC-registered name)			Agent (if applicable) (For a company, use SCC-registered name)		
Mailing address			Mailing address		
City	State	Zip Code	City	State	Zip Code
Phone number w/area code	Fax		Phone number w/area code	Fax	
Mobile/pager	E-mail		Mobile/pager	E-mail	
State Corporation Commission ID number (if applicable)			State Corporation Commission ID number (if applicable)		
<i>Certain permits or permit authorizations may be provided via electronic mail. If the applicant wishes to receive their permit via electronic mail, please provide an e-mail address here: _____</i>					
Property owner(s), if different from applicant (For a company, use SCC-registered name)			Contractor, if known (For a company, use SCC-registered name)		
Mailing address			Mailing address		
City	State	Zip code	City	State	Zip code
Phone number w/area code	Fax		Phone number w/area code	Fax	
Mobile/pager	E-mail		Mobile/pager	E-mail	
State Corporation Commission ID number (if applicable)			State Corporation Commission ID number (if applicable)		

**3. PROVIDE A DESCRIPTION OF THE PROJECT, PROJECT PRIMARY AND SECONDARY PURPOSES, PROJECT NEED, INTENDED USE, AND ALTERNATIVES CONSIDERED (Attach additional sheets if necessary)**

- The purpose must include any new development or expansion of an existing land use and/or proposed future use of residual land
- Describe the physical alteration of surface waters
- Include a description of alternatives considered to avoid or minimize impacts to surface waters, including wetlands, to the maximum extent practicable. Include factors such as, but not limited to, alternative construction technologies, alternative project layout and design, alternative locations, local land use regulations, and existing infrastructure
- For utility crossings, include both alternative routes and alternative construction methodologies considered
- For major surface water withdrawals, public surface water supply withdrawals, or projects that will alter in-stream flows, include the water supply issues that form the basis of the proposed project.

--

**9. WETLANDS/WATERS IMPACT INFORMATION (Continued)**

DEQ classification of impacted resource(s): Estuarine Class II Non-tidal waters Class III Mountainous zone waters Class IV Stockable trout waters Class V Natural trout waters Class VI Wetlands Class VII			
For DEQ permitting purposes, also submit as part of this section a wetland and waters boundary delineation map <sup>(d)</sup> – see the Footnotes section in the form instructions.			
For DEQ permitting purposes, also submit as part of this section a written disclosure of all wetlands, open water, or streams that are located within the proposed project or compensation areas that are also under a deed restriction, conservation easement, restrictive covenant, or other land-use protective instrument.			

**10. APPLICANT, AGENT, OWNER, AND CONTRACTOR CERTIFICATIONS**

If the Applicant(s), Agent(s), Owner(s), or Contractor(s) is/are a company, please use the company name(s) that is/are registered with the State Corporation Commission (SCC).

**READ ALL OF THE FOLLOWING CAREFULLY BEFORE SIGNING**

**PRIVACY ACT STATEMENT:** The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection Research and Sanctuaries Act of 1972. These laws require that individuals obtain permits that authorize structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters prior to undertaking the activity. Information provided in the Joint Permit Application will be used in the permit review process and is a matter of public record once the application is filed. Disclosure of the requested information is voluntary, but it may not be possible to evaluate the permit application or to issue a permit if the information requested is not provided.

**CERTIFICATION:** I am hereby applying for permits typically issued by the DEQ, VMRC, U.S. Army Corps of Engineers, and/or Local Wetlands Boards for the activities I have described herein. I agree to allow the duly authorized representatives of any regulatory or advisory agency to enter upon the premises of the project site at reasonable times to inspect and photograph site conditions, both in reviewing a proposal to issue a permit and after permit issuance to determine compliance with the permit.

In addition, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Is/Are the Applicant(s) and Owner(s) the same? ☐ Yes ☐ No

Applicant's name & title (printed or typed)	Second applicant's name & title, if applicable (printed or typed)
Applicant's signature	Second applicant's signature
Date	Date
(Required for VMRC permit actions only) Property owner's name, if different from Applicant	(Required for VMRC permit actions only) Second property owner's name, if applicable
Owner's signature, if different from Applicant	Second owner's signature
Date	Date

**10. APPLICANT, AGENT, OWNER, AND CONTRACTOR CERTIFICATIONS (Continued)**

If the Applicant(s), Agent(s), Owner(s), or Contractor(s) is/are a company, please use the company name(s) that is/are registered with the State Corporation Commission (SCC).

**CERTIFICATION OF AUTHORIZATION TO ALLOW AGENT(S) TO ACT ON APPLICANT'S(S) BEHALF (IF APPLICABLE)**

I (we), \_\_\_\_\_ (and) \_\_\_\_\_,  
 APPLICANT'S NAME(S) – *complete the second blank if more than one Applicant*

hereby certify that I (we) have authorized \_\_\_\_\_ (and) \_\_\_\_\_  
 AGENT'S NAME(S) – *complete the second blank if more than one Agent*

to act on my (our) behalf and take all actions necessary to the processing, issuance, and acceptance of this permit and any and all standard and special conditions attached. I (we) hereby certify that the information submitted in this application is true and accurate to the best of my (our) knowledge.

Applicant's signature	Second applicant's signature, if applicable
Date	Date
Agent's signature and title	Second agent's signature and title, if applicable
Date	Date

**CONTRACTOR ACKNOWLEDGEMENT (IF APPLICABLE)**

I (we), \_\_\_\_\_ (and) \_\_\_\_\_,  
 APPLICANT'S NAME(S) – *complete the second blank if more than one Applicant*

have contracted \_\_\_\_\_ (and) \_\_\_\_\_  
 CONTRACTOR'S NAME(S) – *complete the second blank if more than one Contractor*

to perform the work described in this Joint Permit Application, signed and dated \_\_\_\_\_.

I (we) will read and abide by all conditions as set forth in all Federal, State, and Local permits as required for this project. I (we) understand that failure to follow the conditions of the permits may constitute a violation of applicable Federal, State, and Local statutes and that we will be liable for any civil and/or criminal penalties imposed by these statutes.

In addition, I (we) agree to make available a copy of any permit to any regulatory representative visiting the project site to ensure permit compliance. If I (we) fail to provide the applicable permit upon request, I (we) understand that the representative will have the option of stopping our operation until it has been determined that we have a properly signed and executed permit and are in full compliance with all of the terms and conditions.

Contractor's name or name of firm (printed/typed)	Contractor's or firm's mailing address	
Contractor's signature and title	Contractor's license number	Date
Applicant's signature	Second applicant's signature, if applicable	
Date	Date	



END OF GENERAL INFORMATION

The following sections are activity-specific. Fill out only the sections that apply to your particular project.



**25. OUTFALLS NOT ASSOCIATED WITH PROPOSED WATER WITHDRAWAL ACTIVITIES**

Type and size of pipe(s): \_\_\_\_\_

Daily rate of discharge: \_\_\_\_\_ mgd

If the discharge will be thermally-altered, provide the maximum temperature: \_\_\_\_\_

Contributing drainage area: \_\_\_\_\_ square miles

Average daily stream flow at site: \_\_\_\_\_ cfs

Have you received a Virginia Discharge Elimination System (VPDES) permit for the proposed project? \_\_\_\_ Yes \_\_\_\_ No.

If yes, please provide the VPDES permit number: \_\_\_\_\_.

If no, is there a permit action pending? \_\_\_\_ Yes \_\_\_\_ No. If pending, what is the facility name? \_\_\_\_\_.

*The following sections are typically related to surface water withdrawal activities; Federal Energy Regulatory Commission license projects; or impacts likely to require instream flow limits. Examples of such projects include, but are not limited to, reservoirs, irrigation projects, power generation facilities, and public water supply facilities that may or may not have associated features, such as dams, intake pipes, outfall structures, berms, etc.*

*If completing these sections, enter "N/A" in any section that does not apply to the project.*

**26. INTAKES, OUTFALLS, AND WATER CONTROL STRUCTURES (INCLUDING ALL PROPOSED WATER WITHDRAWAL ACTIVITIES)**

For intakes:

Type and size of pipe(s): \_\_\_\_\_

Type and size of pump(s): \_\_\_\_\_

Daily rate of withdrawal: \_\_\_\_\_ mgd

Velocity of withdrawal: \_\_\_\_\_ fps

Screen mesh size: \_\_\_\_\_ inches / \_\_\_\_\_ mm

If other sizing units, please specify: \_\_\_\_\_

Contributing drainage area at withdrawal point(s): \_\_\_\_\_ square miles

Average daily stream flow at withdrawal point(s): \_\_\_\_\_ cfs

Average annual stream flow at withdrawal point(s): \_\_\_\_\_ cfs

Latitude and longitude of withdrawal point(s) (degrees, minutes, seconds): \_\_\_\_\_

For outfalls:

Type and size of pipe(s): \_\_\_\_\_

Daily rate of discharge: \_\_\_\_\_ mgd

If the discharge will be thermally-altered, provide the maximum temperature: \_\_\_\_\_

Contributing drainage area at discharge point(s): \_\_\_\_\_ square miles

Average daily stream flow at discharge point(s): \_\_\_\_\_ cfs

Latitude and longitude of discharge point(s) (degrees, minutes, seconds): \_\_\_\_\_

For intakes and dams, use the table below to provide the median monthly stream flows in cubic feet per second (cfs) at the water intake or dam site (not at the stream gage; if there is not a gage at the intake or dam site, you will need to interpolate flows to the intake or dam site based upon the most closely related watershed in which there is an operational stream gage monitored by the United States Geologic Survey (USGS)). Median flow is the value at which half of the measurements are above and half of the measurements are below. Median is also sometimes referred to as the '50% exceedence flow'. The median flow generally must be calculated from USGS historical data. Please do not provide *mean (average)* flow.

Month	Median flow (cfs)	Month	Median flow (cfs)
January		July	
February		August	
March		September	
April		October	
May		November	
June		December	

**26. INTAKES, OUTFALLS, AND WATER CONTROL STRUCTURES (Continued)**

For interbasin transfer of water resources proposed from either the Chowan River, New River, Potomac River, Roanoke River, Big Sandy River, or Tennessee River basins to another river basin, provide the following information:

For the destination location (discharge point) of the transfer:

8- digit USGS Hydrologic Unit Code (HUC) (See <http://cfpub.epa.gov/surf/locate/index.cfm>): \_\_\_\_\_

If known, indicate the 10-digit and 12-digit USGS HUCs (see <http://dswcapps.dcr.virginia.gov/htdocs/maps/HUExplorer.htm>): \_\_\_\_\_

Latitude and Longitude: \_\_\_\_- \_\_\_\_- \_\_\_\_/ \_\_\_\_- \_\_\_\_- \_\_\_\_

Describe the stream flow gages used, the type of calculations used (such as drainage area correction factors), and the period of record that was used to calculate the median flows provided in the table above. Generally, the period of record should span a minimum of 30 years.

Provide any available historical low-flows at the intake or dam site.

Describe how the proposed withdrawal at the intake or dam site will impact stream flows in terms of rates, volumes, frequency, etc. (i.e. percent of the flow to be withdrawn, percent of withdrawal returned to the original source, etc.).

Describe how the withdrawal of water will vary over time. For example, will the withdrawal vary by the time of year, by the time of day, or by the time of week? Examples of projects that should describe variable withdrawals include, but are not limited to: power plant cooling withdrawals that increase and decrease seasonally; golf course irrigation; municipal water supply; nurseries; ski resorts that use water for snowmaking; and resorts with weekend or seasonal variations.

Provide the amount of water that will be lost due to consumptive use. For the purpose of this application, consumptive use means the withdrawal of surface waters without recycling of said waters to their source or basin of origin. Examples of consumptive uses are water that is evaporated in cooling towers or by other means in power plants; irrigation water (all types); residential water use that takes place outside of the home; and residential water use both inside and outside of homes for residences served by septic systems. Projects that propose a transfer of water from one river basin to another and/or localities that sell water to other jurisdictions, should document the portion of the withdrawal that is not returned to the originating watershed.

Proposed monthly consumptive volume: \_\_\_\_\_

Attach a map showing the location of the withdrawal and the location of the return of flow.

**26. INTAKES, OUTFALLS, AND WATER CONTROL STRUCTURES (Continued)**

For withdrawals proposed on an impoundment, provide a description of flow or release control structures. Include type of structure, size, capacity, and the mechanism used to control release. Provide a description of available water storage facilities. Include the volume, depth, normal pool elevation, unusable storage volume and dimensions. If applicable, stage-storage relationship at the impounding structure and volume or rate of withdrawals from the storage facility.

For withdrawals proposed on an impoundment, provide a description of flow or release control structures. Include type of structure, size, capacity, and the mechanism used to control release.

**27. WATER WITHDRAWAL USE, NEED, AND ALTERNATIVES**

Describe the proposed use of the water withdrawal.

Provide the following information at the water intake or dam site. Specify the units of measurement (i.e. million gallons per day, gallons per minute, cubic feet per second, etc.).

Proposed maximum instantaneous withdrawal \_\_\_\_\_

Proposed average daily withdrawal \_\_\_\_\_

Proposed maximum daily withdrawal \_\_\_\_\_

Proposed maximum monthly withdrawal \_\_\_\_\_

Proposed maximum annual withdrawal \_\_\_\_\_

Describe how the above withdrawals were calculated, including the relevant assumptions made in that calculation and the documentation or resources used to support the calculations, such as population projections, population growth rates, per-capita use, new uses, changes to service areas, and if applicable, evapotranspiration data and irrigation data.

**27. WATER WITHDRAWAL USE, NEED AND ALTERNATIVES (Continued)**

For major surface water withdrawals, public water supply withdrawals, and projects that will alter instream flows, provide information to establish the local water supply need:

Existing supply sources, yields, and demands: \_\_\_\_\_

Peak day withdrawal: \_\_\_\_\_

Average daily withdrawal: \_\_\_\_\_

Safe yield: \_\_\_\_\_

Lowest daily flow of record: \_\_\_\_\_

Types of water uses: \_\_\_\_\_

Existing water conservation measures and drought response plan, including what conditions trigger implementation: \_\_\_\_\_

Projected demands over a minimum 30-year planning period: \_\_\_\_\_

Projected demands in local or regional water supply plan (9 VAC 25-780 et seq.) or demand for the project service area, if that is smaller in area: \_\_\_\_\_

Statistical population (growth) trends: \_\_\_\_\_

Projected demands by use type: \_\_\_\_\_

Projected demands without water conservation measures: \_\_\_\_\_

Projected demands with long-term water conservation measures: \_\_\_\_\_

For surface water withdrawals other than public water supply, provide information or documentation that demonstrates alternate sources of water are available for the proposed project during times of reduced instream flow.

Provide information from the water supply plan that covers the area in which the proposed water withdrawal project is located. Include information from the plan that pertains to projected demand, analysis of alternatives, and water conservation measures. Discuss any discrepancies between the water supply plan and the proposed project. For projects that propose a transfer of water resources from the Chowan River, New River, Potomac River, Roanoke River, Big Sandy River, or Tennessee River basins to another river basin, information should be provided from the water supply plans for both the source and receiving basins.

Provide an alternatives analysis for the proposed water withdrawal project, including the required range of alternatives to be analyzed; a narrative outlining the opportunities and status of regional efforts undertaken; and the criteria used to evaluate each alternative. The analysis must address all of the criteria contained in 9 VAC 25-210-115 C 2 and 9 VAC 25-210-115 C 3.

## **27. WATER WITHDRAWAL USE, NEED AND ALTERNATIVES (Continued)**

Describe any existing, flow-dependent beneficial uses along the affected stream reach. Include both instream and offstream uses. Describe the stream flow necessary to protect existing beneficial uses, how the proposed withdrawal will impact existing beneficial uses, and any measures proposed to mitigate any adverse impacts that may arise. For projects that propose a transfer of water resources from the Chowan River, New River, Potomac River, Roanoke River, Big Sandy River, or Tennessee River basins to another river basin, this analysis should include both the source and receiving basins. For the purposes of this application, beneficial instream uses include, but are not limited to: the protection of fish and wildlife habitat; maintenance of waste assimilation; recreation; navigation; and cultural and aesthetic values. Offstream beneficial uses include, but are not limited to: domestic (including public water supply); agriculture; electric power generation; commercial; and industrial.

Describe the aquatic life known to be present along the affected stream reach. Describe aquatic life that may be impacted by the proposed water withdrawal. Include the species' habitat requirements. For projects that propose a transfer of water resources from either the Chowan River, New River, Potomac River, Roanoke River, Big Sandy River, or Tennessee River basins to another river basin, this analysis should include both the source and receiving basins.

## **28. PUBLIC COMMENTS/ISSUES FOR MAJOR WATER WITHDRAWALS OR INTERBASIN TRANSFERS**

For new or expanded major surface water supply projects, use separate sheets of paper to summarize the steps taken to seek public input per 9 VAC 25-210-75, and identify the issues raised during the public information process.

For interbasin transfer of water resources proposed from either the Chowan River, New River, Potomac River, Roanoke River, Big Sandy River, or Tennessee River basins to another river basin, if public input was not required per 9 VAC 25-210-75, summarize on separate sheets of paper any coordination and/or notice provided to the public, local/state government, and interested parties in the affected river basins and identify any issues raised.



b) VADEQ application for a groundwater withdrawal permit (instructional material is not shown).



COMMONWEALTH of VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL QUALITY

APPLICATION FOR A GROUND WATER WITHDRAWAL PERMIT  
(FOR USE IN GROUND WATER MANAGEMENT AREAS)

PREAPPLICATION CONFERENCE DATE: \_\_\_\_\_

1. **APPLICANT INFORMATION:** FIN/SSN: \_\_\_\_\_  
Applicant: \_\_\_\_\_ Phone: \_\_\_\_\_  
Applicant Address: \_\_\_\_\_  
(Street, City, State, Zip Code)

2. **FACILITY INFORMATION:**  
Facility/System Name: \_\_\_\_\_  
Facility Address: \_\_\_\_\_  
(If Applicable, Street, City, State, Zip Code)  
Contact Name: \_\_\_\_\_ Title: \_\_\_\_\_ Phone: \_\_\_\_\_  
Fax: \_\_\_\_\_  
Location of Withdrawal Well or Well System: \_\_\_\_\_  
(County/City)

3. **TYPE OF APPLICATION:**  
This application is for:  
☐ Existing withdrawal, not previously permitted  
☐ New withdrawal  
☐ Expand or enlarge existing permit No. \_\_\_\_\_  
☐ Modification of permit No. \_\_\_\_\_  
☐ Reapplication for existing permit No. \_\_\_\_\_ with modification  
☐ Reissue existing permit No. \_\_\_\_\_ without modification  
Existing withdrawal permit amount \_\_\_\_\_ gallons per \_\_\_\_\_ (Day,Month,Year)  
Date of expiration of existing Ground Water Withdrawal Permit \_\_\_\_\_  
Requested withdrawal amount \_\_\_\_\_ maximum gallons per year,  
\_\_\_\_\_ maximum gallons per month

4. **TYPE OF USE:** (Check all that apply)

<u>USE</u>	<u>%USE</u>	<u>%USE</u>
<input type="checkbox"/> Public Water Supply _____		<input type="checkbox"/> Aquaculture _____
<input type="checkbox"/> Industrial _____		<input type="checkbox"/> Golf Course Irrigation _____
<input type="checkbox"/> Commercial _____		<input type="checkbox"/> Landscape Irrigation _____
<input type="checkbox"/> Fire Protection _____		<input type="checkbox"/> Nursery _____
<input type="checkbox"/> Drought Relief _____		<input type="checkbox"/> Crop Irrigation _____
<input type="checkbox"/> Livestock Watering _____		<input type="checkbox"/> Other _____

If type of use is public water supply;

Estimate the percentage of the withdrawal for human consumptive use \_\_\_\_\_ %;

Attach a complete copy of the Virginia Department of Health Water Works Operation Permit and Engineering Description Sheets or equivalent.

OFFICE USE ONLY		Application # _____
Date Application Received _____	Date Fee Received _____	Amount _____
Notice Date _____	LGOF Date _____	Returned _____ Date Complete _____

Revised 8/1/2005



**5. JUSTIFICATION FOR THE AMOUNT OF WITHDRAWAL REQUESTED:**

Briefly describe the nature of the activity and the proposed beneficial use of ground water.

---



---



---

**Documentation of beneficial use:** Attach documentation demonstrating that the annual and monthly amount of ground water withdrawal requested is the smallest amount of withdrawal necessary to support the proposed beneficial use and that the amount is representative to support similar uses when adequate conservation measures are employed.

Include a description of the product produced or the service provided, the unit of measure (acres, lbs., bushels, etc.) of the product or service, the unit of time that the product or service is produced (day, month, year), the amount of water (gallons) required to produce a unit of product or service, and the quantity of the product or service. Include all calculations showing the total amount of water required to produce a product or provide a service.

Attach a line drawing showing the water flow through the facility/system. Indicate wells, meter locations, sources of surface intake, and treatment, or other operations generating wastewater. Construct a water balance on the line drawing by showing average flows between intakes, treatment units and discharge points.

**Water demand projections:** Include documentation to support the intended beneficial use over a ten year permit cycle such as population and water demand projections and expansion plans. Describe special treatment (i.e. RO, EDR) when proposed.

**Apportionment of withdrawal to individual wells:** Attach an operational pumping schedule for applications with multiple wells. Indicate whether the withdrawal from each well is daily, seasonal or intermittent. Describe the frequency of use and pumping volume for each well for each month in a calendar year.

**6. WASTEWATER TREATMENT AND DISPOSAL:**

Will wastewater be generated as a result of the withdrawal of ground water?

☐ YES ☐ NO (If yes, check the appropriate box below.)

☐ Septic Tank and Drainfield

☐ Public Sewer \_\_\_\_\_  
(Name of system)

☐ State Waters \_\_\_\_\_  
(Name of water body)

Discharge Permit #

☐ Have applied for a discharge permit from the Department of Environmental Quality.

**7. WELL LOCATION(S):**

Locate all wells (existing, proposed, abandoned, out of service), facility property boundaries and/or water supply service area associated with the application on a (1) United States Geological Survey 7 1/2 minute topographic map, or copies of such maps, and (2) detailed location map of each existing and proposed well. The USGS map should contain the quadrangle name, the scale of the map, and a north arrow. The detailed location map must be of sufficient detail such that all wells may be easily located for site inspection.

Revised 8/1/05





**16. EVALUATION OF THE 80% DRAWDOWN CRITERION:**

Pursuant to 9 VAC 25-610-110 D.3.h. of the Ground Water Withdrawal Regulations, DEQ staff will conduct an evaluation to demonstrate that the proposed withdrawal in combination with all existing lawful withdrawals will not lower water levels, in any confined aquifer that the withdrawal impacts, below a point that represents 80% of the distance between the historical prepumping water levels in the aquifer and the top of the aquifer at the points that are halfway between the proposed withdrawal site and the predicted one foot drawdown contour based on the predicted stabilized effects of the proposed withdrawal. Ground water withdrawal permit applications which do not meet the 80% drawdown criteria will be denied.

**17. ADDITIONAL INFORMATION REQUIRED BY THE BOARD**

In addition to information requested at the preapplication conference, DEQ staff may require hydrogeologic and geophysical information necessary to characterize the aquifer system during application processing and review to obtain a complete application. Information including, but not limited to, the following may be required:

- ☐ Aquifer testing plan
- ☐ Pump test (step drawdown test);
- ☐ Aquifer test (constant rate discharge test);
- ☐ Monitoring well installation;
- ☐ Collection and analysis of drill cuttings;
- ☐ Collection and analysis of continuous core;
- ☐ Geophysical logs (spontaneous potential, single point resistance, 16/64 short and long normal resistivity, and natural gamma)
- ☐ Camera survey
- ☐ Water quality sampling;
- ☐ Other

I certify under penalty of law that this document and all information submitted were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is to the best of my knowledge, accurate and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations. I further certify that I am an authorized signatory as specified in the Ground Water Withdrawal Permit Regulation 9 VAC 25-610-10 et seq.

Signature: \_\_\_\_\_

Date : \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

Phone: \_\_\_\_\_

## **Appendix B**

### Example state withdrawal reporting forms

Example reporting forms are provided below for informational purposes. Most states allow mail-in and on-line withdrawal reporting. Examples of each are provided.

## Maryland

### Example groundwater withdrawal reporting form:

MARYLAND DEPARTMENT OF THE ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION  
SOURCE PROTECTION AND APPROPRIATION DIV  
1800 WASHINGTON BOULEVARD  
BALTIMORE, MARYLAND 21230

April 24, 2013

Permit: \*\* GROUND WATER PERMIT \*\*

Make Name/Address Changes Below

Dear Permittee:

As a condition of your Maryland Water Appropriation and Use Permit, you are requested to report your water withdrawal. Please complete and return this form no later than 30 days after the date on which it is received. If you have any questions concerning this form, please telephone the Water Supply Program at (410) 537-3590.

**2012 AGRICULTURAL WATER WITHDRAWAL REPORT BY GALLONS**

1. Check the method used to determine your withdrawal amounts:

( ) # Hours x Gallons per Minute Pumped x 60 Minutes  
( ) Flow Meter ( ) Elapsed Time Indicator  
( ) Other (Explain)

2. Total all intakes under this permit and enter the number of gallons of water withdrawn for each month.  
(Insert a zero if there is no withdrawal.)

January	2012	_____gal	July	2012	_____gal
February	2012	_____gal	August	2012	_____gal
March	2012	_____gal	September	2012	_____gal
April	2012	_____gal	October	2012	_____gal
May	2012	_____gal	November	2012	_____gal
June	2012	_____gal	December	2012	_____gal
Jan-June Total		_____gal	Jul-Dec Total		_____gal

Submitted By: \_\_\_\_\_ (Please print) Date: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

## Virginia

Example on-line water withdrawal reporting form:

DEPARTMENT OF ENVIRONMENTAL QUALITY (DEQ)  
ANNUAL REPORT OF WATER WITHDRAWALS

For the Period: January 1, 2012 to December 31, 2012

**DEADLINE DATE FOR COMPLETED AND SIGNED REPORT: JANUARY 31, 2013**

Note: ' \*\*\* ' indicates a mandatory field.

OWNER NAME:

 \*\*\*

FACILITY:

 \*\*\*

SYSTEM:

 \*\*\*

### System Information Verification

#### PRIMARY CONTACT

CONTACT NAME:

Address/PO Box:

PO Box:

City:

State and Zip:

Phone:

Contact Title:

eMail Address:

#### SECONDARY CONTACT (Waterworks Operator, Lessee, etc.)

CONTACT NAME:

Address/PO Box:

PO Box:

City:

State and Zip:

Phone:

Contact Title:

eMail Address:

Water Source/Well Name:

Category:  SIC:

Type:

\*\*\*

Sub-Type:

Source Status:

- ☐ In Active Use  
☐ No Withdrawal This Year  
☐ Permanently Abandoned\*\*\*  
(If "Permanently Abandoned", Please indicate the year removed from operation: )

Action Type:

MP ID:

DEQ Well ID (if applicable):

GW Permit:

VDH PWSID:

VPDES Permit #:

Intake Location

(County/City/Town):

\*\*\*

River Basin:

Latitude:

Longitude:

Measuring Method:

- ☐ Metered  
☐ Estimated\*\*\*

If Estimated,  
Please Describe:

Source/Customer Metering:

- ☐ Source  
☐ Customer

**Water Withdrawal Amount or Bulk Transfers  
in Million Gallons (MG)**

Current Withdrawals		Previously Reported
Calendar Year: 2012		
Jan (MG):	<input type="text"/> ***	
Feb (MG):	<input type="text"/> ***	
Mar (MG):	<input type="text"/> ***	
Apr (MG):	<input type="text"/> ***	
May (MG):	<input type="text"/> ***	
Jun (MG):	<input type="text"/> ***	
Jul (MG):	<input type="text"/> ***	
Aug (MG):	<input type="text"/> ***	
Sep (MG):	<input type="text"/> ***	
Oct (MG):	<input type="text"/> ***	
Nov (MG):	<input type="text"/> ***	
Dec (MG):	<input type="text"/> ***	
Total (MG):	0.0000	

Please enter Lat/Lon in Decimal Degrees - To convert from Degrees:Minutes:Seconds to Decimal Degrees go here - <http://www.fcc.gov/mb/audio/bickel/DDDMSS-decimal.html>)

Maximum Day:

\*\*\*MG

Month Max Day occurred:

\*\*\*



## West Virginia

Large Quantity User registration and reporting forms for water providers and industrial users<sup>4</sup>. For industrial users, only one example of several alternative discharge reporting forms is shown.



LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
WATER PROVIDER  
Page 1 of 5



### FIELDS WITH ASTERISK ARE REQUIRED

SECTION I - GENERAL INFORMATION		2014
1	Facility Name *	
2	Facility Mailing Address 1 *	
3	Facility Mailing Address 2	
4	Facility Mailing City *	
5	Facility State *	
6	Facility Mailing Zip Code *	
7	Facility E-Mail	
8	Facility Phone *	
9	Facility Fax	
10	SIC Code *	
11	NAICS Code	
12	No. Employees at Facility *	
13	Facility FEIN *	
14	Facility Physical Address 1 *	
15	Facility Physical Address 2	
16	Facility Physical City *	
17	Facility Physical State *	
18	Facility Physical Zip Code *	
19	Facility County *	
20	Owner Name *	
21	Owner FEIN	
22	Owner Address 1 *	
23	Owner Address 2	
24	Owner City *	
25	Owner State *	
26	Owner Zip Code *	
27	Owner Phone *	
28	Owner E-Mail	
29	Contact First Name *	
30	Contact Last Name *	
31	Contact Phone *	
32	Contact E-Mail	
33	Facility PWSID Code *	
34	Do you have water purchased from a provider? *	Yes <input type="checkbox"/> No <input type="checkbox"/>
35	What is your daily maximum potential (gal/day) to withdraw?	
36	What is your present monthly maximum potential (gal) to withdraw?	

<sup>4</sup> WVDEP also has an on-line form for registering and reporting water use for hydraulic fracturing in wells (<http://www.dep.wv.gov/WWE/wateruse/Pages/FracWaterReportingForm.aspx>, accessed 6/2/2015).



LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
WATER PROVIDER  
Page 2 of 5



37	Within next 5 years, what is your anticipated monthly maximum potential (gal) to withdraw?											
38	List zip codes for areas you serve	<table style="width: 100%; text-align: center;"> <tr> <td><input style="width: 40px; height: 20px;" type="text"/></td> <td><input style="width: 40px; height: 20px;" type="text"/></td> <td><input style="width: 40px; height: 20px;" type="text"/></td> <td><input style="width: 40px; height: 20px;" type="text"/></td> <td><input style="width: 40px; height: 20px;" type="text"/></td> </tr> <tr> <td><input style="width: 40px; height: 20px;" type="text"/></td> <td><input style="width: 40px; height: 20px;" type="text"/></td> <td><input style="width: 40px; height: 20px;" type="text"/></td> <td><input style="width: 40px; height: 20px;" type="text"/></td> <td><input style="width: 40px; height: 20px;" type="text"/></td> </tr> </table>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>
<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>								
<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>								
39	Describe stream flow conditions that impact withdrawal rates.											
40	Describe seasonal conditions that impact withdrawals.											
41	Have you implemented water conservation practices in the past 5 years? Describe.	Yes <input type="checkbox"/> No <input type="checkbox"/>										
42	Estimate the water saved per month (in gal) by these practices.											
43	If you have work planned within next 5 years to conserve water use, describe the project and give an estimated project cost.											
44	Estimate the water saved per month (gal) by the planned project.											
45	On average, what % of water is lost during conveyance?											
46	Additional Comments:											
47	Year of Closure (only applicable if facility no longer withdraws water)											



LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
WATER PROVIDER  
Page 3 of 5



**USE SEPARATE FORM FOR EACH SURFACE WATER WITHDRAWAL**

<b>SURFACE WATER WITHDRAWAL</b>	<b>2014</b>
Your Name for Intake *	
County *	
State *	
Decimal Latitude *	
Decimal Longitude *	
How was location determined? *	
Water source name *	
Water source type *	Spring <input type="checkbox"/> Lake/Impoundment <input type="checkbox"/> Stream/River <input type="checkbox"/>
How did you determine withdrawal info? *	Metered <input type="checkbox"/> Calculated <input type="checkbox"/>
If calculated, describe how calculation was made *	

2014 Surface Water Withdrawal (Gallons/Month)	
January *	
February *	
March *	
April *	
May *	
June *	
July *	
August *	
September *	
October *	
November *	
December *	



LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
WATER PROVIDER  
Page 4 of 5



**USE SEPARATE FORM FOR EACH GROUNDWATER WITHDRAWAL**

<b>GROUNDWATER WITHDRAWAL</b>	<b>2014</b>
Your Name for Intake *	
County *	
State *	
Decimal Latitude *	
Decimal Longitude *	
How was location determined? *	
Well Depth (feet) *	
Aquifer Source *	Alluvial Aquifer <input type="checkbox"/> Mississippian <input type="checkbox"/> Upper Pennsylvanian & Permian <input type="checkbox"/> Middle Pennsylvanian <input type="checkbox"/> Lower Pennsylvanian <input type="checkbox"/> Devonian / Silurian <input type="checkbox"/> Ordovician/Cambrian <input type="checkbox"/> Unknown <input type="checkbox"/>
Type of Rock *	Sandstone <input type="checkbox"/> Sand & Gravel <input type="checkbox"/> Shale <input type="checkbox"/> Limestone/Dolomite <input type="checkbox"/> Underground Mine <input type="checkbox"/> Interbedded Sandstone & Shale <input type="checkbox"/> Interbedded Sandstone, Limestone & Shale <input type="checkbox"/> Unknown <input type="checkbox"/>
How did you determine withdrawal info? *	Metered <input type="checkbox"/> Calculated <input type="checkbox"/>
If calculated, describe how calculation was made *	

2014 Groundwater Withdrawal (Gallons/Month)	
January *	
February *	
March *	
April *	
May *	
June *	
July *	
August *	
September *	
October *	
November *	
December *	



LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
 WATER PROVIDER  
 Page 5 of 5



WATER PROVIDER (PURCHASED WATER)	2014
Provider Name *	

2014 Purchased Water - Gallons/Month	
January *	
February *	
March *	
April *	
May *	
June *	
July *	
August *	
September *	
October *	
November *	
December *	



LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
INDUSTRIAL USER Page 1 of 12



**FIELDS WITH ASTERISK ARE REQUIRED**

	SECTION I - GENERAL INFORMATION	2014
1	Facility Name *	
2	Facility Mailing Address 1 *	
3	Facility Mailing Address 2	
4	Facility Mailing City *	
5	Facility State *	
6	Facility Mailing Zip Code *	
7	Facility E-Mail	
8	Facility Phone *	
9	Facility Fax	
10	SIC Code *	
11	NAICS Code	
12	No. Employees at Facility *	
13	Facility FEIN *	
14	Facility Physical Address 1 *	
15	Facility Physical Address 2	
16	Facility Physical City *	
17	Facility Physical State *	
18	Facility Physical Zip Code *	
19	Facility County *	
20	Owner Name *	
21	Owner FEIN	
22	Owner Address 1 *	
23	Owner Address 2	
24	Owner City *	
25	Owner State *	
26	Owner Zip Code *	
27	Owner Phone *	
28	Owner E-Mail	
29	Contact First Name *	
30	Contact Last Name *	
31	Contact Phone *	
32	Contact E-Mail	
33	If you are sharing intake and discharge points with multiple facilities and including them in your survey, please list facilities and their contact info	
34	Brief description of processes requiring water withdrawals (cooling water, heating, irrigation, etc.)	
35	Type of water use (not related to mineral extraction) *	Industrial <input type="checkbox"/> Commercial <input type="checkbox"/> Irrigation <input type="checkbox"/> Recreational <input type="checkbox"/> Public Water <input type="checkbox"/> Power Generation <input type="checkbox"/>



LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
INDUSTRIAL USER Page 2 of 12



	Type of water use (mineral extraction use) *	Coal <input type="checkbox"/> Salt <input type="checkbox"/> Quarry <input type="checkbox"/> Oil/Gas <input type="checkbox"/>
36	Do you have any water purchased from a provider? *	Yes <input type="checkbox"/> No <input type="checkbox"/>
37	What is your daily maximum potential (gal) to withdraw?	
38	What is your present monthly maximum potential (gal) to withdraw?	
39	Within the next 5 years, what is your anticipated monthly maximum potential (gal) to withdraw?	
40	For coal fired electric generators, what is the facility nominal design capacity (gal) per calendar day?	
41	Where do you discharge? *	POTW <input type="checkbox"/> Stream <input type="checkbox"/> UIW/Septic Tank <input type="checkbox"/> Private Reservoir <input type="checkbox"/> Lake <input type="checkbox"/>
42	Describe stream flow conditions that impact withdrawal rates?	
43	Describe seasonal conditions that impact withdrawals?	
44	Have you implemented water conservation practices in the past five years? Describe.	Yes <input type="checkbox"/> No <input type="checkbox"/>
45	Estimate the water saved per month (in gal) by these practices.	
46	If you have work planned within the next five years to conserve water use, describe the project and give an estimated project cost.	
47	Estimate the water saved per month (gal) by the planned project.	
48	Additional Comments	
49	Year of Closure (only applicable if facility no longer withdraws water)	



LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
INDUSTRIAL USER Page 3 of 12



**USE SEPARATE FORM FOR EACH FACILITY**

	<b>SECTION II - MULTIPLE FACILITIES</b>	<b>2014</b>
1	Facility Name *	
2	Facility Address 1 *	
3	Facility Address 2	
4	Facility City *	
5	Facility State *	
6	Facility Zip Code *	
7	Facility Phone *	





LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
INDUSTRIAL USER Page 4 of 12



SECTION III -- WATER WITHDRAWALS

USE SEPARATE FORM FOR EACH SURFACE WATER WITHDRAWAL

SURFACE WATER WITHDRAWAL		2014
1	Your Name for Intake *	
2	County *	
3	State *	
4	Decimal Latitude *	
5	Decimal Longitude *	
6	How was location determined? *	
7	Water source name *	
8	Water source type *	Spring <input type="checkbox"/> Lake/Impoundment <input type="checkbox"/> Stream/River <input type="checkbox"/>
9	How did you determine withdrawal info *	Metered <input type="checkbox"/> Calculated <input type="checkbox"/>
10	If calculated, describe how calculated *	
11	INTENTIONALLY LEFT BLANK	
12	What is the water used for? *	Mining <input type="checkbox"/> Petroleum <input type="checkbox"/> Recreation <input type="checkbox"/> Timber <input type="checkbox"/> Agriculture / Aquaculture <input type="checkbox"/> Industrial <input type="checkbox"/> Public Water Suppliers <input type="checkbox"/> Chemical <input type="checkbox"/> Thermoelectric (Coal) <input type="checkbox"/> Hydro Electric <input type="checkbox"/>

2014 Surface Water Withdrawal (Gallons/Month)	
January *	
February *	
March *	
April *	
May *	
June *	
July *	
August *	
September *	
October *	
November *	
December *	

DEFINITIONS FOR "WHAT IS THE WATER USED FOR?"

**Mining** – Coal mining, coal processing plants, quarries, any other type of mining activity where rocks or minerals are removed from the earth.

**Petroleum** – Waterfloods. Does not include water used when hydrofracing a well. That is reported on another form.

**Recreation** – hotels, golf course, campgrounds, water parks, etc.

**Timber** – Including facilities that manufacture wood products – pulp mills, charcoal manufacturers, dimensional lumber, etc.

**Agriculture / Aquaculture** – Irrigation, fish farming, production of feed for farm animals, etc.

**Industrial** – General manufacturing other than chemical.

**Public Water Supply** – Provide water primarily for human consumption.

**Chemical** – Manufacture of chemicals, chemical compounds, etc., regardless of feedstock source.

**Thermoelectric** – Generation of electric power where heat is the primary motive force and water is used for steam or cooling purposes (i.e. a coal burning plant that boils water creating steam to turn the turbines)

**Hydroelectric** – Generation of electric power where water is the motive force. There is little or no consumptive use of the water in the generation process (i.e. a power plant at a dam that uses the water flowing out of the dam to turn the turbine).



# LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014 INDUSTRIAL USER

Page 5 of 12



## USE SEPARATE FORM FOR EACH GROUNDWATER WITHDRAWAL

GROUNDWATER WITHDRAWAL		2014
1	Your Name for Intake *	
2	County *	
3	State *	
4	Decimal Latitude *	
5	Decimal Longitude *	
6	How was location determined *	
7	Well Depth (feet) *	
8	Aquifer Source *	Alluvial Aquifer <input type="checkbox"/> Middle Pennsylvanian <input type="checkbox"/> Lower Pennsylvanian <input type="checkbox"/> Mississippian <input type="checkbox"/> Upper Pennsylvanian & Permian <input type="checkbox"/> Unknown <input type="checkbox"/> Devonian/Silurian <input type="checkbox"/> Ordovician & Cambrian <input type="checkbox"/>
9	Type of Rock *	Sandstone <input type="checkbox"/> Sand & Gravel <input type="checkbox"/> Shale <input type="checkbox"/> Limestone/Dolomite <input type="checkbox"/> Underground Mine <input type="checkbox"/> Interbedded Sandstone & Shale <input type="checkbox"/> Unknown <input type="checkbox"/> Interbedded Sandstone, Limestone & Shale <input type="checkbox"/>
10	How did you determine withdrawal info *	Metered <input type="checkbox"/> Calculated <input type="checkbox"/>
11	If calculated, describe how calculated *	
12	What is the water used for? *	Mining <input type="checkbox"/> Petroleum <input type="checkbox"/> Recreation <input type="checkbox"/> Timber <input type="checkbox"/> Agriculture / Aquaculture <input type="checkbox"/> Industrial <input type="checkbox"/> Public Water Suppliers <input type="checkbox"/> Chemical <input type="checkbox"/> Thermoelectric (Coal) <input type="checkbox"/> Hydro Electric <input type="checkbox"/>

### DEFINITIONS FOR "WHAT IS THE WATER USED FOR?"

**Mining** – Coal mining, coal processing plants, quarries, any other type of mining activity where rocks or minerals are removed from the earth.

**Petroleum** – Waterfloods. Does not include water used when hydrofracing a well. That is reported on another form.

**Recreation** – Hotels, golf courses, campgrounds, water parks, etc.

**Timber** – Including facilities that manufacture wood products - pulp mills, charcoal manufacturers, dimensional lumber, etc.

**Agriculture/Aquaculture** – Irrigation, fish farming, production of feed for farm animals, etc.

**Industrial** – General manufacturing other than chemical.

**Public Water Supply** – Provide water primarily for human consumption.

**Chemical** – Manufacture of chemicals, chemical compounds, etc., regardless of feedstock source.

**Thermoelectric** – Generation of electric power where heat is the primary motive force and water is used for steam or cooling purposes (i.e. a coal burning plant that boils water creating steam to turn the turbines.)

**Hydroelectric** – Generation of electric power where water is the motive force. There is little or no consumptive use of the water in the generation process (i.e. a power plant at a dam that uses the water flowing out of the dam to turn the turbine).

2014 Groundwater Withdrawal (Gal/Month)	
January *	
February *	
March *	
April *	
May *	
June *	
July *	
August *	
September *	
October *	
November *	
December *	



LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
INDUSTRIAL USER  
Page 6 of 12



WATER PROVIDER (PURCHASED WATER)		2014
1	Provider Name *	

2014 Purchased Water (Gallons/Month)	
January *	
February *	
March *	
April *	
May *	
June *	
July *	
August *	
September *	
October *	
November *	
December *	



LARGE QUANTITY WATER USER REGISTRATION FORM FOR 2014  
INDUSTRIAL USER  
Page 7 of 12



SECTION IV -- WATER DISCHARGE

USE SEPARATE FORM FOR EACH POTW DISCHARGE

POTW - WATER DISCHARGE		2014
1	POTW Name *	
2	Decimal Latitude *	
3	Decimal Longitude *	
4	How was location determined? *	

2014 POTW Discharge (Gallons/Month)	
January *	
February *	
March *	
April *	
May *	
June *	
July *	
August *	
September *	
October *	
November *	
December *	

## Appendix C

### Comparison tables of select state water withdrawal database field types

**Table C-1** contains select fields from the water withdrawal data tables provided by each state, specifically those fields related to withdrawal point information, site information, withdrawal amount information, and metadata. The data were provided to ICPRB by the states in response to specific requests. This information is provided for comparison purposes only. Each state also collects many other data fields specific to that state (**Table C-2**). Note: field names and the listing sequence were modified to enhance readability.

**Table C-1.** Comparison table of withdrawal point information, site information, withdrawal amount information, and metadata fields.

Data Type	Maryland	Pennsylvania	Virginia	West Virginia
Withdrawal Point Information	Site Number	Parent WUDS Facility Id	Measuring Point Id	Facility Id
	Site Name	WUDS Sub Facility Id	Site Name	Facility Name
	Source Type SW or GW	Sub Facility Name	Source Type SW or GW	Intake Point Id
	Source Subtype	Sub Facility Type	Source Subtype	Source Type SW or GW
	Decimal Latitude	Sub Facility Designation	Longitude	Surface Water Subtype
	Decimal Longitude	Latitude Degrees	Latitude	Source Name
	Northing MD State Plane, thousands feet	Latitude Minutes	State and Count FIPS Code	Latitude
	Northing MD State Plane feet	Latitude Seconds	County	Longitude
	Easting MD state plane, thousands feet	Longitude Degrees	River Basin	8-Digit HUC Number
	Easting MD state plane feet	Longitude Minutes	Measuring Point HUC	HUC Name
	State Name	Longitude Seconds		
	County Name			
	County FIPS Code			
	State FIPS Code			
Site Information	Permit revision number	Primary Facility Name	Owner Name	Facility Name
	Water Appropriation Permit Id	Primary Facility Id	Facility	Desc Name
	Owner	Primary Facility Type	Facility SIC	Water Use Type

Data Type	Maryland	Pennsylvania	Virginia	West Virginia
	National Water Use Code	WUDS Primary Facility Id	Use Category	
	National Water Use Name	WUDS Facility Id		
	Site Use Code			
	Use Type 1			
	Use Type 2			
	Use Type 3			
	Use Type 4			
Withdrawal Amount Information	Year	Report Year	Year	Year
	Monthly Quantity	Withdrawal Month	Monthly Quantity	Water Volume
	Annual Value	Withdrawal Monthly Amount	Annual Value	Month
	Annual Average (gpd)	Report Month	Annual Average (gpd)	
		Month Quantity	Annual	
		Annual Water Use	Annual/365	
		Annual Days Use (Percent)	Max Day	
		Withdrawal Monthly Days	Max Month	
		Annual Days Use		
		Month Days Use		
Metadata	Agency Code	Date Received	Received	Facility Mailing Address
	Data Source Code	Report Source	Processed	Facility Mailing City
	Method Code	Date Accepted	Method	Facility Mailing State
	Accuracy Code	Potability Type Code	Method Description	Facility Mailing Zip Code
	Annual Reporting Unit Name	Measure Method Code	Meter Type	Contact Name
	Monthly Reporting Unit Name	Measure Method Description	Entity	Contact Phone
	Water Quantity Comment	Last Date Tested	Accuracy	
	Annual Significant Figures	Last Tested By		
	Method Name	Double Counted		
	Annual Reporting Unit Phrase			
	Monthly Reporting Unit Phrase			

**Table C-2.** Comparison table of other state collected data elements.

	<b>Maryland</b>	<b>Pennsylvania</b>	<b>Virginia</b>	<b>West Virginia</b>
Other State Collected Data Elements	Site Type Long Name	Primary Facility Designation	Action	Closure Year
	Water Quantity Code	Purchase Month	Region	Aquifer Source
	Data Aging Code	Purchase Monthly Amount	Salinity	
	Preferred Flag	Purchase Monthly Days	Max Day	
	Irrigation Method Code	Yield	Max Month	
	Irrigation Method Name	Maximum Inflow	Revised On	
	Salinity Code	Permit Capacity	Revised By	
	Salinity Name	Water Level Measured	Abandoned	
	Published Date	Transfer WUDS Facility Id	Crop 1	
	Calculated Flag	Transfer Interconnection Id	Crop 2	
	Water Quantity Name	Transfer From Max Capacity	Acres	
	National Aquifer Code	Transfer To Max Capacity	GW Permit	
	National Aquifer Name	Transfer From Quantity	VWP Permit	
	Primary Use of Site	Transfer From Day Use	VPDES Permit	
	Well Depth	Transfer To Quantity	VDH Number	
	Hole Depth	Transfer To Days Use	Well Number	
	Permit Effective Date	Watershed	VADEQ Well	
	Reporting Code	SubBasin Name		
	Average Permitted (gpd)	Basin		
	Maximum Permitted (gpd)			
	Basin			
	Use 1 Percentage			
	Use 2 Percentage			
	Use 3 Percentage			
	Use 4 Percentage			
	Use 1 Quantity			
	Use 2 Quantity			
	Use 3 Quantity			

	<b>Maryland</b>	<b>Pennsylvania</b>	<b>Virginia</b>	<b>West Virginia</b>
	Use 4 Quantity			
	Status			
	Use 1 Description			
	Use 2 Description			
	Use 3 Description			
	Use 4 Description			