Surface Water Transfer Worksheet Instructions

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If you have questions about the surface water transfer regulations, or need assistance completing these worksheets, please contact Toya Ogallo in the Division of Water Resources at (919) 715-0389, or email: Toya.F.Ogallo@ncdenr.gov.

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Introduction

The Division of Water Resources (DWR) has developed the attached worksheets to help water systems document existing and planned surface water transfers, also known as interbasin transfers (IBT). DWR asks water systems to provide this information if it appears that they are transferring a significant amount of water between river basins. Water systems may also be asked to provide this information as part of their Local Water Supply Plan (LWSP) updates or during SEPA environmental document reviews. The Division uses this documentation to identify systems that may eventually need to apply for an interbasin transfer certificate.

The IBT worksheets include Water Balance Tables for determining average and maximum daily transfers (current and projected), and a form for determining the grandfathered transfer capacity. Instructions are included before each form. In addition, this packet includes completed sample forms for the fictitious Town of Pirateville.

Why Document Transfers?

In 1993, the North Carolina Legislature adopted the Regulation of Surface Water Transfers Act (G.S. §143-215.22I). The law regulates large surface water transfers between river basins by requiring a certificate from the Environmental Management Commission (EMC) based on an evaluation of the impacts to both the source and receiving basins. The act has been modified several time since it was first adopted, most recently in 2007 when part .22I was repealed and replaced with part .22L.

The provisions of the Surface Water Transfer Act apply to the 38 river basins defined in (G.S. §143-215.22G). An IBT certificate is required for any transfer, above the following thresholds, between any of these basins. A map of the designated river basins is provided in Figure 1.

Water systems meeting the following criteria are required to apply for an Interbasin Transfer (IBT) Certificate:

(1) Initiate a new transfer of at least 2 million gallons per day (MGD) of surface water from one river basin to another;
(2) Increase an existing transfer by 25% or more above the average daily flow (ADF) transferred from June 30, 1992 - 1 July 1993 (if the total transfer including the increase is more than 2 MGD);
(3) Increase an existing transfer above the amount approved by the Commission in a certificate issued prior to 1 July 1993.

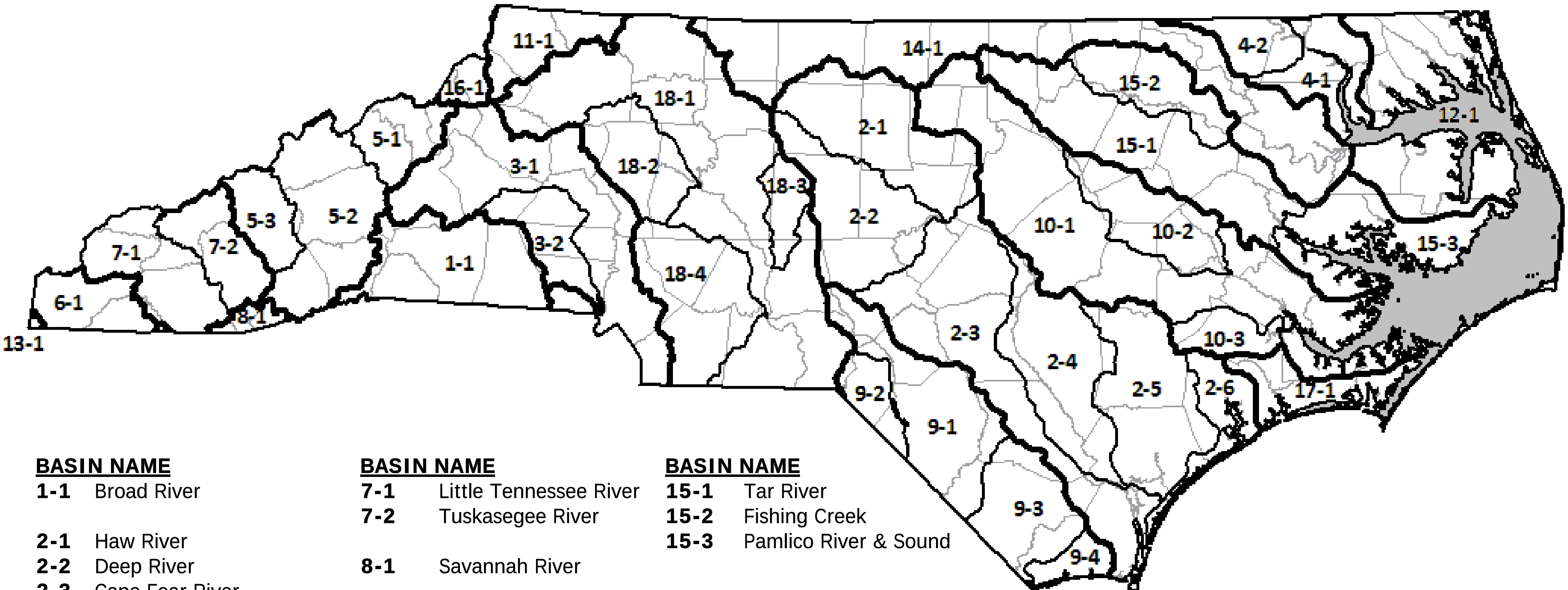
Due to the fact that the Surface Water Transfer Act was first adopted in 1993, many of the IBT rules and requirements reference a water system's daily flows and capacity at that time. Facilities that were in existence prior to 1993 are said to have a Grandfathered IBT Capacity up to either 25% above their average daily transfer at that time, their system capacity to transfer surface water at that time, or 2 MGD - whichever is greater. If a facility existed or was under construction by July 1, 1993, a certificate is not required up to the full capacity of that facility to transfer surface water, regardless of the transfer amount.

The procedure for obtaining an Interbasin Transfer Certificate is specifically laid out in G.S. §143-215.22L. The full process can take three to five years and offers a number of opportunities for public comment and review. The Division has prepared a guidance document for water systems that are considering the interbasin transfer certification process. That document is available on our website at:

http://www.ncwater.org/Permits_and_Registration/Interbasin_Transfer/

Figure 1.

Designated Interbasin Transfer River Basins
As defined in G.S. §143-215.22G



BASIN NAME

1-1 Broad River

2-1 Haw River
2-2 Deep River
2-3 Cape Fear River
2-4 South River
2-5 Northeast Cape Fear River
2-6 New River

3-1 Catawba River
3-2 South Fork Catawba River

4-1 Chowan River
4-2 Meherrin River

5-1 Nolichucky River
5-2 French Broad River
5-3 Pigeon River

6-1 Hiwassee River

BASIN NAME

7-1 Little Tennessee River
7-2 Tuskasegee River

8-1 Savannah River

9-1 Lumber River
9-2 Big Shoe Heel Creek
9-3 Waccamaw River
9-4 Shallotte River

10-1 Neuse River
10-2 Contentnea Creek
10-3 Trent River

11-1 New River

12-1 Albemarle Sound

13-1 Ocoee River

14-1 Roanoke River

BASIN NAME

15-1 Tar River
15-2 Fishing Creek
15-3 Pamlico River & Sound

16-1 Watauga River

17-1 White Oak River

18-1 Yadkin River
18-2 South Yadkin River
18-3 Uwharrie River
18-4 Rocky River

In many cases, proper documentation of pre-existing transfers can postpone (or eliminate) the need to pursue a transfer certificate. Since the documentation requires operational records going back to 1992, it is important to verify the system's grandfathered capacity by completing these worksheets while the necessary records are still available..

Which Forms Do You Need to Fill Out?

The level of documentation varies according to the amount of your transfer:

Estimated "Max-Day" Surface Water Transfer[1]	Documentation Required
< 100,000 gpd	Estimate transfer volumes and acknowledge in LWSP.
100,000 gpd to 1.0 MGD	Submit water balance tables (Average Day and Maximum Day).
> 1.0 MGD	Submit Grandfathered IBT worksheet and water balance tables (Average Day and Maximum Day).

Note:

1. You may need to multiply an estimated **average annual transfer** by a peaking factor to determine an equivalent **maximum daily transfer**. See the Water Balance Table instructions for more information.

Instructions for Completing IBT Water Balance Tables

Completing a water balance table is the easiest way to characterize a system's existing and future interbasin transfers. Tables for estimating average and maximum daily water use are attached. In addition, sample tables have been provided for the hypothetical Town of Pirateville.

Each table should reflect the transfer between one source basin and one receiving basin. If your system has multiple source or receiving basins, you should complete one set of tables (average and maximum daily flows) for each pair.

Before you get started

You will find it helpful to have several pieces of information on hand to complete the water balance tables. Some information that may be useful includes:

- Historical (1992-1993) population and service area information
- 50-year population projections
- Customer water-use demographics (residential vs industrial/commercial, sewered vs septic)
- Customer locational information and expected growth patterns (# of customers in source vs receiving basin(s))
- Water treatment plant data (number of plants, permit limit, and surface water source)
- Regular (not emergency) water system purchases (surface water source, contract volume and applicable dates)
- Wastewater treatment plant data (number of plants, permit limit, and receiving stream)
- Regular (not emergency) water system sales (receiving basin, contract volume, and applicable dates)
- List of anticipated/planned water system expansion projects within the 50 year horizon (including water treatment and wastewater plants).

The goal of gathering this information is to have an understanding of the inputs and outputs to the system so that a water balance can be developed. Make sure to collect enough detail that you are able to characterize any unusual situations that might affect your water balance, such as large water customers that are not wastewater customers (and vice versa), unusual seasonal variation (such as in coastal communities), and losses or additions due to industry. **Do not include any groundwater inputs to the system.**

Column A

The data used for the water balance tables should correlate to LWSP data. The historical data should align with information submitted in past LWSP updates and the projections should account for a 50-year planning horizon-- consistent with data required in the LWSP. Projections may need to be based on a combination of population forecasts, per capita use, facility expansion plans, industrial recruitment efforts, and other available information.

Column B

List the name of the water system. In complex scenarios, where there may be sales to other water systems, it may be necessary to insert additional rows into the table. The water system that owns the pipe transferring the water across the basin boundary is responsible for the transfer.

Here is an example of how to represent multiple water systems on the IBT water balance worksheets. This method can also be used to simplify the overall water balance by breaking one system into multiple service areas.

Year (A)	Water System (B)	Withdrawal from Source (C)
1992	Pirateville	2.7 MGD
1992	Purchaser	0.5 MGD
1997	Pirateville	
1997	Purchaser	
2002		

Column (C)

Enter daily raw water withdrawals or purchase amounts in MGD (either average or maximum day values, depending on the water balance worksheet being completed). Include only surface water withdrawals and/or purchases. If withdrawals occur in more than one basin, complete a separate table for each source basin. Make sure to account for all sources of surface water to the system.

Columns (D) and (E)

Estimate the average daily consumptive loss, in MGD, for each basin. *Consumptive loss is the amount of water that is not directly discharged into a receiving stream*. Examples include septic systems, landscape irrigation, evaporative cooling, system losses, system flushing, and other uses in which the water is consumed by the environment.

Typically, this value is determined as the difference between the total withdrawal and total discharge, and generally ranges from 15 to 30 percent of total use. A system that has 100% of customers on septic systems may have close to 100% consumptive losses. Consumptive loss may vary by customer type or use pattern in different service areas.

Columns (F) and (G)

Enter the average (or maximum) daily wastewater discharge for each basin in MGD.

Column (H)

Calculate the total *return to the source* basin by adding column (D) (consumptive loss in the source basin) and column (F) (wastewater discharged to the source basin). This is water that is *not* transferred.

Column (I)

Estimate the water being transferred by subtracting column (H) (water not transferred) from column (C) (total water withdrawn from source).

Repeat these steps for the Maximum Daily Value table. Maximum daily values may be determined either from actual records or by applying a peaking factor to the average daily values. Note that an analysis of water usage during a dry year will yield a higher (worst case scenario) peaking factor than usage during a wet year. ***Please attach any documentation detailing assumptions and/or data sources used in completing the tables.***

INTERBASIN TRANSFER WATER BALANCE TABLE

- AVERAGE DAILY TRANSFER ESTIMATES -

Water System : ______________________ Date : ______________

Source Basin : ______________________ Prepared By : ______________

Receiving Basin(s) : ______________________

Year[2] (A)	Water System (B)	Withdrawal from Source[1] (MGD) (C)	Consumptive Loss[1]		Wastewater Discharge[1]		Total Return to Source Basin[1] (MGD) (H)=(D)+(F)	Total Surface Water Transfer[1] (MGD) (I)=(C)-(H)
			Source Basin (MGD) (D)	Receiving Basin[3] (MGD) (E)	Source Basin (MGD) (F)	Receiving Basin[3] (MGD) (G)		
1992								
2010								
2020								
2030								
2040								
2050								
2060								

Notes:

1. All numbers are expressed in million gallons per day (MGD) rounded to two decimal places.
2. The row marked 2010 should be used to estimate current data (change date to reflect current year). Future years should account for a 50 year planning timeframe (consistent with LWSP projections). Additional rows may be added to mark system milestones or critical planning timeframes (planned expansions, increased industrial user contributions, etc.)
3. If there is more than one receiving basin, you may add additional columns for each basin.

INTERBASIN TRANSFER WATER BALANCE TABLE

- MAXIMUM DAILY TRANSFER ESTIMATES -

Water System : ________________________ Date : ________________

Source Basin : ________________________ Prepared By : ________________

Receiving Basin(s) : ________________________

Year[2] (A)	Water System (B)	Withdrawal from Source[1] (MGD) (C)	Consumptive Loss[1]		Wastewater Discharge[1]		Total Return to Source Basin[1] (MGD) (H)=(D)+(F)	Total Surface Water Transfer[1] (MGD) (I)=(C)-(H)
			Source Basin (MGD) (D)	Receiving Basin[3] (MGD) (E)	Source Basin (MGD) (F)	Receiving Basin[3] (MGD) (G)		
1992								
2010								
2020								
2030								
2040								
2050								
2060								

Notes:

1. All numbers are expressed in million gallons per day (MGD) rounded to two decimal places.
2. The row marked 2010 should be used to estimate current data (change date to reflect current year). Future years should account for a 50 year planning timeframe (consistent with LWSP projections). Additional rows may be added to mark system milestones or critical planning timeframes (planned expansions, increased industrial user contributions, etc.).
3. If there is more than one receiving basin, you may add additional columns for each basin..

Instructions for Completing the Grandfathered Transfer Capacity Worksheet

North Carolina General Statutes 143-215.22L(a) require that water systems meeting any of the following criteria apply for an Interbasin Transfer (IBT) Certificate:

(1) Initiate a new transfer of at least 2 million gallons per day (MGD) of surface water from one river basin to another;
(2) Increase an existing transfer by 25% or more above the average daily flow (ADF) transferred from June 30, 1992- 1 July 1993 (if the total transfer including the increase is more than 2 MGD);
(3) Increase an existing transfer above the amount approved by the Commission in a certificate issued prior to 1 July 1993.

The purpose of the Grandfathered Transfer Capacity worksheet is to help water systems calculate and document the above thresholds. Systems exceeding their grandfathered capacity must obtain an interbasin transfer certificate from the EMC.

One grandfathered transfer capacity worksheet should be completed for each source basin involved in the transfer. If multiple source basins are involved, complete a separate worksheet **for each source basin.**

Section A

The purpose of this section is to determine a 25% increase in the average daily transfer (line 1) for the year ending July 1, 1993, as noted in NCGS 143-215.22L(a)(2). In the absence of data for the year of June 30, 1992- July 1, 1993, you may choose to use the estimated 1992 value from the Average Daily Transfer Water Balance Table. If the transfer did not occur each day of the year then a yearly average must be calculated (**2b**).

Section B

NCGS §143-215.22L (b) provides one exception to the IBT thresholds, stating:

> *... A certificate shall not be required to transfer water from one river basin to another up to the full capacity of a facility to transfer water from one basin to another if the facility was in existence or under construction on 1 July 1993.*

The purpose of Section B is to estimate the “full capacity of a facility to transfer water” as of July 1, 1993. The transfer capacity of a water system is limited by its most restrictive system element.

4(a)-(b): The potable water capacity is the sum of all surface water inputs to the system. This is usually the permitted water treatment plant (WTP) capacity (sum of all WTPs owned by the system) but can also include regular surface water purchases. Any surface water source available as of July 1, 1993 should be included.

(5): Enter the maximum capacity of the distribution network to carry water across the basin boundary into the receiving basin. This may be based on pipe sizing or pump systems that were in place before July 1, 1993.

(6): The discharge capacity in the receiving basin is a combination of wastewater discharges and consumptive losses.

> **(6a):** Enter the combined permitted capacity of all wastewater treatment plants in the receiving basin.
>
> **(6b):** The permitted capacity from 6a must be adjusted by a factor so that it reflects a "max-day" amount rather than the "max-month" amount used in NPDES permits. Typical max-day/max-month conversion factors may range from 1.25-1.75. Actual facility data should be used to develop an appropriate peaking factor.
>
> **(6c):** Multiply (6a) by (6b) to determine a max-day allowable wastewater discharge.
>
> **(6d):** Enter the maximum daily consumptive loss in the receiving basin. This value should correspond to the values used on the 'max day' water balance tables.
>
> **(6e):** Enter all other discharge capacity. Examples include bulk sales.

(7): The minimum capacity of (4), (5), or (6) is the most restrictive system element. Therefore, this was the maximum capacity of the system to transfer water on July 1, 1993.

(8): The Grandfathered Transfer Capacity is defined as the greater of the amount shown in (7) or 2.0 MGD. This amount is used to estimate certification requirements.

Section C

Use the appropriate Water Balance Table to determine the year a certification would be required based on each threshold.

(9): Enter the year in which the system's ***average*** daily interbasin transfer exceeds the amount listed in (3). Attach an ***average*** daily transfer water balance table starting in 1992.

(10): Enter the year in which the system's ***maximum*** daily interbasin transfer exceeds the amount listed in (7). Attach a ***maximum*** daily transfer water balance table starting in 1992.

INTERBASIN TRANSFER WORKSHEET

-GRANDFATHERED TRANSFER CAPACITY-

Water System:		Date:	
PWSID:		Prepared By:	
Source Basin:			
Receiving Basin(s):			

SECTION A. AVERAGE DAILY TRANSFER FOR THE YEAR ENDING JULY 1, 1993

(1)		Average Daily Transfer (ADT) from 7/1/92 to 6/30/93		MGD
(2)		Did this transfer occur each day of the year? If yes, skip to (3).		
	(2a)	If not, what is the total number of days that the transfer occurred		DAYS
	(2b)	Adjusted Average Daily Transfer = [(2a) * ADT] / 365 (use this number as your new ADT in step (3))		MGD
(3)		25% increase in ADT for the Year Ending 6/30/93 = 1.25*ADT		MGD

SECTION B. TRANSFER CAPACITY AS OF JULY 1, 1993

(4)		Total potable water capacity = (4a) + (4b)		MGD
	(4a)	Combined water treatment plant capacity (permitted)		MGD
	(4b)	Contracts for regular surface water purchases		MGD
(5)		Transfer Capacity of Transmission/Distribution System		MGD
(6)		Total receiving basin discharge capacity = (6c) + (6d) + (6e)		MGD
	(6a)	Combined wastewater treatment plant capacity (permitted)		MGD
	(6b)	Max Day/Max Month discharge ratio		
	(6c)	Max Day WWTP Permitted Capacity = (6a)*(6b)		MGD
	(6d)	Max Day Consumptive Loss		MGD
	(6e)	Other losses (specify): ____		MGD
(7)		Minimum Capacity listed in (4), (5) or (6)		MGD
(8)		Grandfathered Transfer Capacity: the greater of amount shown in (7) or 2.0 MGD:		MGD

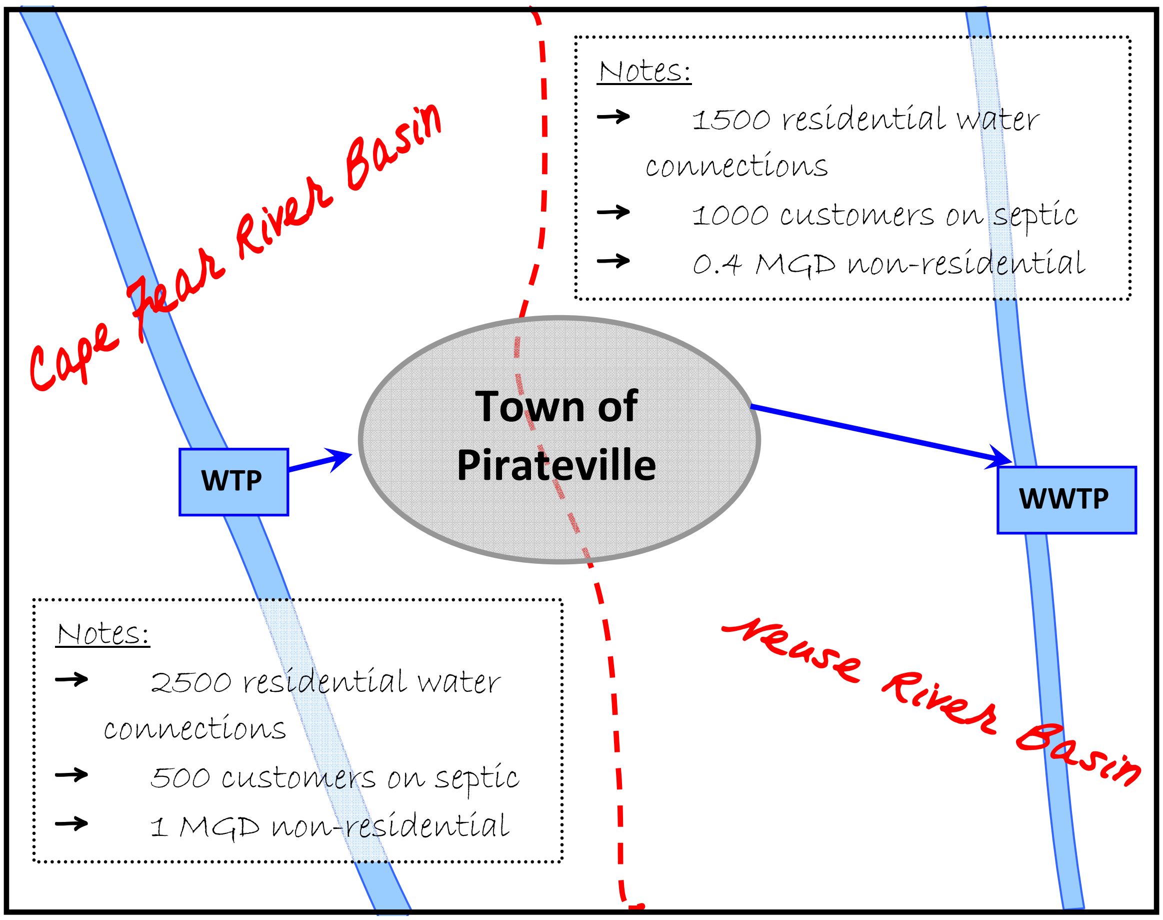
SECTION C. CERTIFICATION REQUIREMENTS

(9)	**Estimate the Year when Certification would be required based on a 25% increase in ADT:** This is the year the average daily transfer exceeds the amount listed in (3). Attach an average daily transfer water balance table starting in 1992	
(10)	**Estimate the Year when Certification would be required based on Grandfathered Transfer Capacity:** This is the year the daily maximum transfer exceeds the amount listed in (8). Attach a maximum daily transfer water balance table starting in 1992.	

SAMPLE ILLUSTRATION

Sample Illustration: Town of Pirateville

The fictitious Town of Pirateville lies on the ridgeline between the Neuse and Cape Fear River Basins, with a portion of its service area in each basin. Its water treatment plant (WTP) processes water from the Cape Fear River and its wastewater treatment plant (WWTP) discharges to the Neuse River. By July 1, 1993, the town had in place 4,000 residential water connections, of which 2,500 were in the Cape Fear basin and 1,500 were in the Neuse basin. Five-hundred of the Cape Fear connections and 1,000 of the Neuse connections were septic tank users. The town also had non-residential connections totaling an average of 1.40 MGD, of which 1.00 MGD was in the Cape Fear basin and 0.40 MGD was in the Neuse basin.



First, we need to determine the consumptive losses so that we can fill out the water balance tables.

Based on withdrawal records, Pirateville had an average daily withdrawal of 3.0 MGD in for this period. Records also indicate that the average wastewater plant discharge was 2.1 MGD. The remaining 0.9 MGD was lost through consumptive uses (water use, landscape irrigation, on-site wastewater disposal, etc). Table 1 illustrates the consumptive loss calculations.

TABLE 1- PIRATEVILLE CONSUMPTIVE LOSS CALCULATIONS[1]

Using the following methodology, the consumptive loss volume and factors for residential customers in both basins can be calculated using the available information. The total consumptive losses should equal 0.9 MGD, which is the difference between average WTP and WWTP flows.

Sub-basin	Type of Connection	# of Connections	Potable Water Use (MGD)	Consumptive Loss Factor	Consumptive Loss (MGD)
(A)	**(B)**	**(C)**	**(D)**	**(E)**	**(F)=(D)*(E)**
Cape Fear	Resid.-WWTP	2,000	0.80	0.16 (calculated)	0.13 (calculated)
	Resid.- Septic	500	0.20	1.00	0.20
	Non-Residential		1.00	0.10	0.10
	Basin Sub-Total	*2,500*	*2.0*		*0.43 MGD*
Neuse	Resid.-WWTP	500	0.20	0.16 (calculated)	0.03 (calculated)
	Resid.- Septic	1.000	0.40	1.00	0.40
	Non-Residential		0.40	0.10	0.04
	Basin Sub-Total	*1,500*	*1.0*		*0.47 MGD*
	Total	**4,000**	**3.0**		**0.9 MGD**

<u>Description of consumptive loss calculations:</u>

Column C- # of Connections – This information is taken directly from the demographic information that we have available for Pirateville.

Column D- Potable Water Usage– In the absence of detailed water use records from 1992, we can simply multiply the number of connections by DEH's water supply design criteria. NC regulations (T15A.18C .0409) require that water treatment plants be designed to provide residential connections with a minimum daily flow of 400 gallons per connection.

Column E - Consumptive Loss Factors – Non-discharge systems will always have 100% consumptive loss since no water is being directly discharged to a receiving stream. Therefore the residential septic systems have a consumptive loss factor of 1.00. Consumptive loss factors for non-residential customers may be determined by considering the nature and actual water use of the customer (i.e. shopping malls or business parks versus major industrial users). If there are no significant non-residential water users, then this classification can be grouped with the residential users. For this example we used a sample consumptive loss factor of 0.1, presumably determined from actual water data.

Column F- Consumptive Loss - The consumptive loss can be determined by simply multiplying the potable water use by the consumptive loss factor

For the Pirateville example, our calculations show that residential customers in the Cape Fear have a total 0.13 MGD consumptive losses and customers in the Neuse Basin have a total consumptive loss of 0.03 MGD. These losses represent a consumptive loss factor of 0.16 (16%) for both basins.

1 Please note that this is one method by which consumptive losses can be apportioned to water users. Depending on the complexity of your system you may find other, more appropriate ways to calculate consumptive losses (such as using different factors based on customer demographics in different basins). Please include a detailed description (including calculations) for any method you choose to use.

After performing the consumptive loss calculations, we can then complete the average-day water balance table (Table 2). Once the table has been completed, we can see that there is an estimated average daily surface water transfer in 1992 of 2.57 MGD from the Cape Fear to the Neuse. The amounts for the remaining years can then be determined based on historical data, past LWSPs (if available), and population forecasts. The maximum daily transfer table can then be completed by multiplying the average daily usage (columns C through G) by a peaking factor. Appropriate peaking factors should be developed by analyzing actual facility data and comparing average daily values to maximum daily values. For the Pirateville example, we used a peaking factor of 1.5 (Table 3).

Once the water balance tables are completed, we can move to the Grandfathered Transfer Capacity Worksheet (if required).

Section A of the Grandfathered Worksheet is completed according to the worksheet instructions. In this example, we are assuming that water use in the 1992 calendar year was the same as the 12 months preceding June 30, 1993. From the water balance table, the average daily transfer is 2.57 MGD . A 25% increase in the ADT would be **3.21 MGD.**

Section B is completed based on a water treatment plant capacity of 5.0 MGD, a distribution capacity of 7.5 MGD, and a wastewater plant capacity of 3.5 MGD.

In Section C, the surface water transfer amounts in the average daily water balance table are compared with the grandfathered transfer amount from Item (3). Average daily transfers exceed 3.21 MGD sometime around 1999. Therefore, the year 1999 is entered at Item (9). Similarly, surface water transfer amounts in the maximum daily water balance table are compared with the grandfathered transfer capacity from Item (8). The maximum daily transfer is expected to exceed 5.0 MGD close to the year 2001. Therefore, the year 2001 is entered at Item (10). Based on this worksheet, Pirateville would not need an interbasin transfer certificate until the year 2001.

TABLE 2: SAMPLE WATER BALANCE – TOWN OF PIRATEVILLE

Water System: Pirateville | *Date*: December 1, 2009
Source Basin: Cape Fear | *Prepared By*: Water Manager
Receiving Basin(s): Neuse

Water Balance Table - Average Daily Transfers

	Year[3]	Water System	Withdrawal from Source (MGD)	Consumptive Loss (MGD)		Wastewater Discharge (MGD)		Total Return to Source Basin (MGD)	Total Surface Water Transfer (MGD)
				Source Basin	Receiving Basin [5]	Source Basin	Receiving Basin [5]		
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)=(D)+(F)	(I)=(C)-(H)
	1992	Pirateville	3.00	0.43	0.47	0.00	2.10	0.43	2.57
	1997	Pirateville	3.45	0.49	0.54	0.00	2.42	0.49	2.96
Based on historical records or LWSP Data	2002	Pirateville	3.97	0.57	0.62	0.00	2.78	0.57	3.40
	2007	Pirateville	4.56	0.65	0.71	0.00	3.19	0.65	3.91
	2010	Pirateville	5.25	0.75	0.82	0.00	3.67	0.75	4.49
	2020	Pirateville	6.30	0.90	0.99	0.00	4.41	0.90	5.39
	2030	Pirateville	7.56	1.08	1.18	0.00	5.29	1.08	6.47
Extrapolate based on 10-yr population projections	2040	Pirateville	9.07	1.30	1.42	0.00	6.35	1.30	7.77
	2050	Pirateville	10.88	1.56	1.70	0.00	7.62	1.56	9.32
	2060	Pirateville	13.06	1.87	2.05	0.00	9.14	1.87	11.18

TABLE 3: SAMPLE WATER BALANCE – TOWN OF PIRATEVILLE

Water System: Pirateville
Source Basin: Cape Fear
Receiving Basin(s): Neuse

Date: December 1, 2009
Prepared By: Water Manager

Water Balance Table – Maximum Daily Transfers

Year[3]	Water System	Withdrawal from Source (MGD)	Consumptive Loss [4]		Wastewater Discharge		Total Return to Source Basin	Total Surface Water Transfer [5]
			Source Basin	Receiving Basin [5]	Source Basin	Receiving Basin [5]		
(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)=(D)+(F)	(I)=(C)-(H)
1992	Pirateville	4.50	0.65	0.71	0.00	3.15	0.65	3.86
1997	Pirateville	5.18	0.74	0.81	0.00	3.62	0.74	4.43
2002	Pirateville	5.95	0.85	0.93	0.00	4.17	0.85	5.10
2007	Pirateville	6.84	0.98	1.07	0.00	4.79	0.98	5.86
2010	Pirateville	7.87	1.13	1.23	0.00	5.51	1.13	6.74
2020	Pirateville	9.44	1.35	1.48	0.00	6.61	1.35	8.09
2030	Pirateville	11.33	1.62	1.78	0.00	7.93	1.62	9.71
2040	Pirateville	13.60	1.95	2.13	0.00	9.52	1.95	11.65
2050	Pirateville	16.32	2.34	2.56	0.00	11.42	2.34	13.98
2060	Pirateville	19.58	2.81	3.07	0.00	13.71	2.81	16.78

GRANDFATHERED INTERBASIN TRANSFER WORKSHEET

Water System:	Pirateville	Date:	4/1/1999
PWSID:		Prepared By:	Water Manager
Source Basin:	Cape Fear		
Receiving Basin(s):	Neuse		

SECTION A. AVERAGE DAILY TRANSFER FOR THE YEAR ENDING JULY 1, 1993

(1)		Average Daily Transfer (ADT) from 7/1/92 to 6/30/93	2.57	MGD
(2)		Did this transfer occur each day of the year? If yes, skip to (3).		
	(2a)	If not, what is the total number of days that the transfer occurred		DAYS
	(2b)	Adjusted Average Daily Transfer = [(2a) * ADT] / 365 (use this number as your new ADT in step (3))		MGD
(3)		25% increase in ADT for the Year Ending 6/30/93 = 1.25*ADT	3.21	MGD

SECTION B. TRANSFER CAPACITY AS OF JULY 1, 1993

(4)		Total potable water capacity = (4a) + (4b)	5.0	MGD
	(4a)	Combined water treatment plant capacity (permitted)	5.0	MGD
	(4b)	Contracts for regular surface water purchases	-	MGD
(5)		Transfer Capacity of Transmission/Distribution System	7.5	MGD
(6)		Total receiving basin discharge capacity = (6c) + (6d) + (6e)	6.31	MGD
	(6a)	Combined wastewater treatment plant capacity (permitted)	3.5	MGD
	(6b)	Max Day/Max Month discharge ratio	1.6	
	(6c)	Max Day WWTP Permitted Capacity = (6a)*(6b)	5.6	MGD
	(6d)	Max Day Consumptive Loss	0.71	MGD
	(6e)	Other losses (specify): ____		MGD
(7)		Minimum Capacity listed in (4), (5) or (6)	5.0	MGD
(8)		Grandfathered Transfer Capacity: the greater of amount shown in (7) or 2.0 MGD:	5.0	MGD

SECTION C. CERTIFICATION REQUIREMENTS

(9)	**Estimate the Year when Certification would be required based on a 25% increase in ADT:** This is the year the average daily transfer exceeds the amount listed in (3). Attach an <u>average</u> daily transfer water balance table starting in 1992	**1999**
(10)	**Estimate the Year when Certification would be required based on Grandfathered Transfer Capacity:** This is the year the daily maximum transfer exceeds the amount listed in (8). Attach a <u>maximum</u> daily transfer water balance table starting in 1992.	**2001**