

AGREN<sup>®</sup>



**BasinBuilder**

User Manual

## Agren Disclaimer

The content and products associated with Agren's BasinBuilder are provided to you on an "as-is" and "as available" basis. Agren makes no representations or warranties of any kind, expressed or implied, as to the operation of BasinBuilder or the information, estimates, content, materials, products or services included on or associated with BasinBuilder. You expressly agree that your use of BasinBuilder and all products and services included on or associated with BasinBuilder are at your sole risk.

Agren does not make any representations, warranties or guarantees, expressed or implied, regarding the accuracy, correctness, or completeness of the content of BasinBuilder, nor the safety, reliability, title, timeliness, completeness, merchantability, conformity, or fitness for a particular purpose of the content of BasinBuilder. It is your sole responsibility to independently evaluate the accuracy, correctness, or completeness of the content of BasinBuilder.

Agren makes no representation, warranty, or guarantee that the content is free of infection from any viruses, worms, or other code or computer programming routines that are intended to damage or detrimentally interfere with any system data.

## BasinBuilder Introduction

BasinBuilder will step you through the simple process of drawing a dam, watershed, and calculating a runoff curve number. If you choose not to calculate a runoff curve number, you will have the ability to enter your own.

Based on your design criteria, BasinBuilder creates a dynamic spreadsheet that offers a range of basin options. At a glance, you can see options that have a variety of tile sizes, dam heights, percent of stored runoff, drain time, size of temporarily flooded areas, and costs for each basin. Options can then be sorted various ways.

Every report contains a complete cost estimate using county derived costs with an aerial photo showing dam location and the size of the temporary pool.

BasinBuilder allows you to design basins that are in a series, one upstream from another.

With BasinBuilder, all options are developed using high-resolution digital elevation models derived from LiDAR data.

## Initial Subscriber Login

When your account is created by Agren, the subscriber for your account will receive an activation email containing an activation link. The activation link is valid for 30 days. If 30 days has elapsed and the link has not been used, you will need to contact [admin@agrentools.com](mailto:admin@agrentools.com) to have a new activation link sent.

When the subscriber clicks the activation link, they will be prompted to choose a password (see following pages for password requirements).

Enter and confirm your chosen password and click **Activate My Account**. You will be redirected to the login screen, where you will need to log in again with your username (typically your email address) and password.

## Executing the End User License Agreement (EULA)

As the Subscriber, you must execute the End User License Agreement (EULA) before accessing any part of the tools. Click on **Click here to execute the EULA**. Read the EULA and if you agree with the terms, click **I Agree** to execute the EULA.

The current copy of the EULA can always be found by clicking **EULA** in the footer of the login system.

## Managing My Users

Part of the responsibility of the subscriber is to manage the users assigned to their license. Initially, this requires setting up users that can access your license.

Upon executing the EULA, the subscriber will be redirected to the Manage My Users page. The Manage My Users page contains three sections, Add New User, Search & Add Existing User, and Edit Licensed Users.

To add a new user, type in the user's first name, last name, email and company/agency under the grey bar Add New User. The user name will automatically populate when you enter the email address. Clicking **Add New User** will add the user to the license you are logged in to and email them an activation link. (If the user needs to be added to another license you are the subscriber for, you must log into that license and repeat the steps.)

If you would like to add a user that is an existing user on another license, you may enter their user name (typically their email address) under the grey bar Search & Add Existing User. Clicking **Add Existing User** will add the user to the license you are logged in to.

It is the responsibility of the subscriber to keep their license information current as employees are hired or terminated. To remove a user from a license, click **Remove From License** to the right of the user's name under the grey bar Edit Licensed User.

To edit first name, last name, or company, click on the user's name in the first column of the Edit Licensed User table. If you need to change a user's email address or user name, contact

[admin@agrentools.com](mailto:admin@agrentools.com). If a user's activation link has expired, you can also send another activation link by clicking **Resend activation email** from the Manage Individual User page.

A link to Manage My Users can be found in the footer of the login screens.

## Initial User Login

When your subscriber accepts the EULA and sets up the users for a license, activation emails will be sent to each user. The email contains an activation link that is valid for 30 days. If 30 days has elapsed and the link has not been used, you will need to contact your subscriber to have a new activation link sent.

When you click on the activation link, you will be prompted to choose a new password (see below for password requirements).

Enter and confirm your chosen password and click **Activate My Account**. You will be redirected to the login screen, where you will need to login again with your username (typically your email address) and password.

For subsequent logins, go to [www.agrentools.com](http://www.agrentools.com). Click on **LICENSED USER LOGON** in the top right corner of your screen.

## Password Requirements

Passwords must be at least 12 characters in length and may only be repeated once every 24 passwords. In addition, passwords must contain characters from three of the following four categories.

- English uppercase characters (A - Z)
- English lowercase characters (a - z)
- Base 10 digits (0 - 9)
- Non-alphabetic characters (e.g., !, \$, #, %)

Passwords must be changed every 180 days. Seven days before the expiration of your password, you will receive an email notifying you that your password will expire and provide you with instructions on how to change your password. On the day your password expires, you will receive an email notice that your password has expired with a link to the initial login screen to reset your password.

## Resetting Your Password

After three incorrect login attempts, your account will be locked for 15 minutes. After 15 minutes, you may retry your account, or reset your password.

To reset your password, click **Forgot your password?** on the login screen. A Forgot Password screen will come up. Enter your user name (typically your email) and click **Submit** to send an email with a link to reset your password.

When you click the link in the password reset email, you will be redirected to a Reset Password screen. Choose a new password following the requirements above, and confirm. Once your password is updated, you will be prompted to log in again with your user name and new password.

## Managing My Info

To edit your first name, last name, or company, click on your user name (typically your email address) and then click Manage My Info in the footer of the login screens. If you need to change your email address or user name, contact [admin@agrentools.com](mailto:admin@agrentools.com).

## Choosing a License and Tool

From the login screen, choose the license you want to access from the drop down list.

To access Agren's conservation planning tools, click on the tool you would like to use below the license selection.

## Customer Support

The footer of every login screen contains a link to customer support.

If you experience even the smallest problem while using Agren's conservation planning tools, please let us know! We do our best to get you answers within the hour, 8am to 5pm CST Monday through Friday.

There are three ways to contact Agren customer support:

### 1. Click Find a Bug? when using the tools

The Find a Bug? icon (just to the left of Enable Help on the top of your map) records information about your session, as well as a screen shot, and pops up a window where you can type your question or report a bug. This is the best way to report bugs or ask questions because we receive the most information to help diagnose your problem. Please be as descriptive as possible in explaining the problem you are experiencing. Occasionally, we might also ask for a copy of the session you are working on.



### 2. Email [support@agrentools.com](mailto:support@agrentools.com)

Please be as descriptive as possible in explaining the problem you are experiencing.

### 3. Call (712) 792-6248

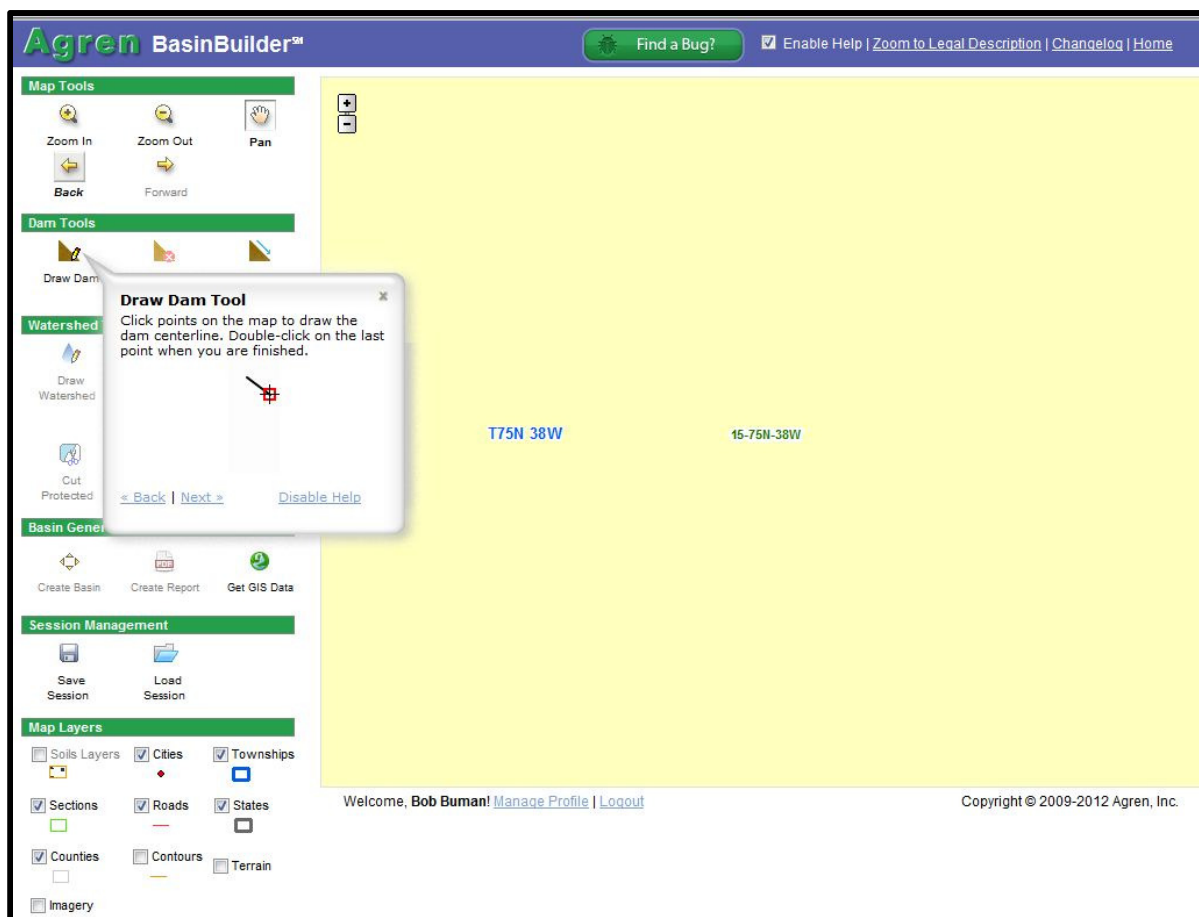
## Enabling and Disabling Help

BasinBuilder is equipped with a help menu that steps you through the process of creating a water & sediment control basin. To enable help, click on the box to the left of **Enable Help** on the blue bar at the top of the page. When this box is checked, **Enable Help** will be turned on. A check mark in the box indicates that the help is on. To move through the step-by-step process, simply click **Next>>** in the help window to advance to the next help screen.

*Click on **Next>>** in the help window to advance to the next help screen.*

At any time, you may temporarily close the help window by clicking the “**X**” in the top right corner of the help window. When you click on another icon, the help menu will reappear.

To disable the help menu, uncheck **Enable Help** in the blue bar on the top of your screen or click **Disable Help** in the bottom right of the help window.



## Zooming to Basin Location

The location of the proposed basin is the first information that is requested. Zoom in far enough that you can easily distinguish the contour lines, but still see the entire basin watershed on the screen. There are two methods to zoom to the desired basin location.

### Method A

Enter a legal description (section, township, and range) and click **Search**. If the box shown at the left does not appear upon program startup, click **Zoom to Legal Description** in the upper right hand corner of your screen.

Click on the **Imagery** box in the bottom left corner of the screen to turn on the aerial photo map layer.

Once you have zoomed to the appropriate section, you may zoom in further one of five ways.

1. Click and hold the left mouse button on one corner of the area of interest. Drag the pointer to the opposite corner drawing a rectangle and release.
2. Using the scroll bar/wheel on the mouse, roll forward to zoom in, roll backward to zoom out.
3. You may also click on **Zoom In** or **Zoom Out** in the map tools to the left of the map and then click once on the area of interest on the map. This way is not recommended because there is no control over the zoom. Frequently this command zooms in too far.
4. Click the **+ or -** in the top left corner of the map to zoom in and out.
5. Press the **+ or -** on the key board of your computer.

### Method B

Click on **Pan** (located to the right of the Zoom In and Zoom Out tools). Then, click and drag the map to the desired location and zoom in or out with one of the five methods described above.

**Zoom to Legal Description**

Welcome to the Agren BasinBuilder<sup>SM</sup>!

Please enter a legal description to begin:

Section:

Township:  N ▼

Range:  W ▼

ex: 28-74N-9W

Always show this box on startup

*If the legal description is known, the Zoom to Legal Description box easily zooms you into the correct location*

*If the Imagery box is in grayed out, you have not zoomed in far enough to use Imagery yet. Zoom in until the Imagery box turns black. (This applies to the Contours and Terrain buttons as well.)*

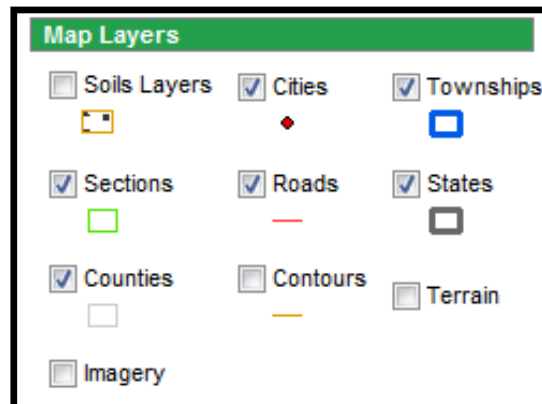
## Map Layer Options

In the bottom left hand corner of your screen, you will find check boxes that allow different viewing options (shown on the right). Check the box next to the map layer(s) you prefer to work with when planning your basin.

**Imagery** provides you with an aerial photo of the area selected. The Imagery layer is available in areas less than 25 miles wide.

**Contours** inserts two-foot contour lines. The Contour layer is available in areas less than two miles wide.

**Terrain** inserts hill shading. The Terrain layer is available in areas less than two miles wide.



Map Layer Options

You may use any combination of imagery, contours, and terrain layers at the same time. However, if you have imagery and terrain layers on at the same time you will only see the terrain layer.

## Drawing your Dam Line

Determine where you want the dam and select the **Draw Dam** tool.

For a straight dam, click once on one side of the valley where you would like your dam to begin. Then, double-click on the other side of the valley where you would like the dam to end.

A dam with a curve in it can be made by clicking once on any number of points between the beginning and end of the dam. As above, double-click to complete the dam.

If the dam is not where you want it, click the **Clear Dam** button and start over.

*If you are using Internet Explorer or FireFox, the right click button on the mouse removes points you created when you drew the dam, watershed, or when you cut the watershed. All other operations use the left click.*



## Drawing your Watershed

It is easiest to show the entire watershed in the viewing frame before you begin to draw the watershed. While drawing the watershed, you can use the + or – in the view, arrow keys on your keyboard, or the scroll bar on your mouse to zoom. While drawing the watershed, the Zoom In and Zoom Out map tools are disabled.

Click the **Draw Watershed** tool. Begin drawing the outline of the watershed. The stretchy polygon line for the watershed boundary is attached to both ends of the dam line so the first and last click point must be upslope from the dam line. As you follow the boundary of the watershed, click every time you change direction. You must start on the same side you ended the dam or your polygon will twist over itself and give you an incorrect watershed.

When you have a polygon drawn around your watershed, double click near where you began the dam to end the watershed drawing process.

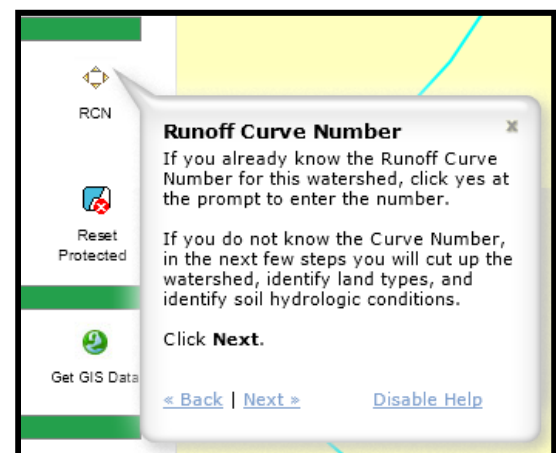
*If you make a mistake drawing the dam or watershed, simply click the **Clear Dam or Clear Watershed** to erase the drawing.*

## Entering the Runoff Curve Number (RCN)

BasinBuilder can calculate a runoff curve number automatically, or you may enter it manually.

Click on **RCN** and follow the prompts. If you already know your runoff curve number, you may enter it at the prompt and then skip to **Create Basin**.

To allow BasinBuilder to calculate your runoff curve number, click **NO** in the RCN Number pop-up box and follow the instructions below to assign hydrologic soil groups, cut land use, and assign land cover.



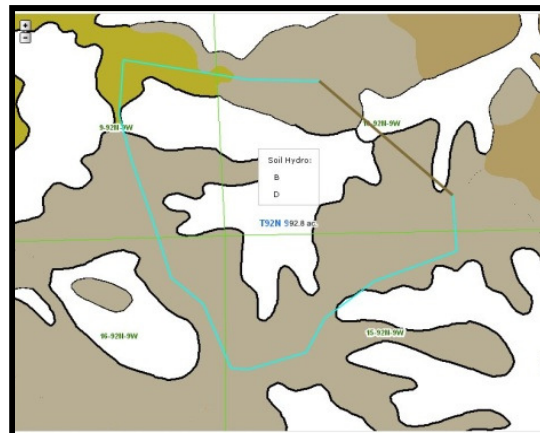
*The Runoff Curve Number Help Box allows you to skip ahead if you already know your RCN value.*

## Assigning Soil Hydrologic Group

To speed up processing, you can turn off the contour and terrain layers. You will need only the imagery layer during the remaining steps. Soil polygons can be assigned dual hydrologic groups. Soil polygons that are white on the map are assigned dual hydrologic groups (A/D, B/D, or C/D). The first letter in a dual hydrologic group represents drained areas and the second letter represents undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes. Existing water bodies at the time of soil hydrologic group assignment could have letters A, B, C, or D. The choice of which of these four letters is used is up to the user.

Left click on each of these polygons and choose the hydrologic group that best represents that polygon. In the case of existing basins, you will have a choice of all four letters. Choose the letter that best represents the basin.

All the white polygons within the watershed must be assigned a letter before a runoff curve number can be calculated.



*Left click to assign soil hydrologic groups to all white polygons. If your watershed does not contain any white areas, you may skip this step.*

## Cutting and Assigning Land Covers

Differentiate land cover types in the watershed by clicking the **Cut Land Covers** tool. Cut up the watershed until all of the cover types are separated.

Cut up the watershed by drawing a polygon around each different cover. First, click on the outside of your watershed polygon. As you follow the edge of your cover type, click every time you change direction and end by double clicking after you have crossed a line.

To draw a polygon around a cover type in the center of the watershed, click on the start point and follow the edge of the cover type. When you get back to the beginning, cross your beginning point and double click to end the polygon.

Click on the **Assign Land Cover Desc** tool. Each region in your watershed must be assigned a cover description (cover type – treatment and hydrologic condition).

To assign a cover type, hold the mouse arrow over a polygon. Left click once on the polygon and a menu of descriptions will be displayed. Next, select the most appropriate cover type for that polygon.

Continue this process until all polygons are labeled. BasinBuilder will not allow you to move to the next step until you have assigned at least 95% of the watershed a cover type.

*If you have not intersected another line both at the beginning and at the end of your drawing, the polygon will not be developed. You may intersect the watershed boundary, another cover type, or the current cover type on which you are working.*



*A variety of cover types are available for Cultivated Agricultural Lands, Non-Cultivated Agricultural Lands, as well as Urban Areas.*

## Estimating the Slope/Length of Tile

Click on the **Slope/Length Estimator** tool to draw in your new tile line. The tool will estimate the length of the new tile and the average slope for every 100 feet. Be sure to draw in the tile downhill, otherwise negative slopes will be reported.

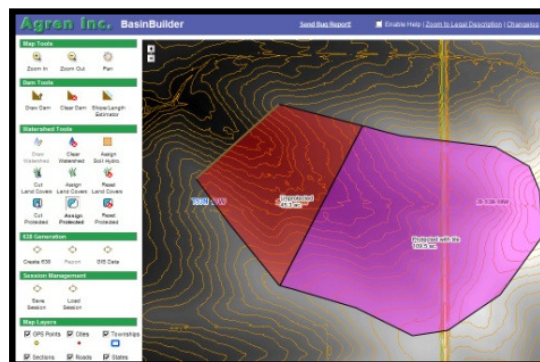
A Tile Info box will be displayed requesting New Tile Slope, New Tile Length, and Existing Tile Slope. Enter the values you estimated using the Slope/Length Estimator here.

You can also use this tool to estimate the slope of existing tile.



## Cutting and Assigning Protected Areas

Determine if the watershed has any areas that are protected by a structure such as terraces, basins, or water and sediment control basins. If a protected area does exist in the watershed, click on the **Cut Protected** tool. First, left click on the outside of your watershed polygon. As you follow the edge of your protected area, click every time you change direction and end by double clicking after you have crossed a line. Then, left click on the **Assign Protected** tool and assign the areas Unprotected, Protected with tile (graded terrace), or Protected without tile (level terrace).



*The red area above designates an unprotected area. The purple area designates an area protected with a graded terraced tile.*

If the entire watershed is unprotected, it will automatically be assigned unprotected. If you choose to assign protected areas of the watershed, BasinBuilder will not allow you to move to the next step until you have assigned at least 95% of the watershed a protected or unprotected status.

## Watershed Definitions for Water and Sediment Control Basins

**Unprotected Area:** The area of the watershed, upstream from the proposed water and sediment control basin that does not have any basins, terraces, or ponds that retain a portion of the water. Or, an area with basins, terraces, or ponds that does not meet engineering design standards (10-year – 24-hour frequency storm without overtopping).

Maximum acres for an unprotected area within a watershed vary, and are determined by your state requirements.

**Protected Area:** The area of the watershed, upstream from the proposed water and sediment control basin that has basins, terraces, or ponds that retains a portion of the water. And, an area that meets engineering design standards (10-year – 24-hour frequency storm without overtopping).

**\*Please refer to Appendix A for a description of different basin scenarios that will work in BasinBuilder.**

## Creating a Basin

You are now ready to create your basin. Click on the **Create Basin** tool to the left of your map under the green heading Basin Generation.

In the top of the Create Basin dialog box, fill in the **New Tile** slope and length if it is not already filled in. If **Existing Tile** runs under the proposed dam, click **Yes** and enter the type, slope, and size. Next, select the **Dam Design**. Finally, enter the front and back **Dam Slopes**.

The values for Curve Number, Avg. Watershed Slope, Erosion Rate, and Dam Top Width automatically default to numbers calculated by BasinBuilder. However, you may override them by clicking **Use my own value** and typing in your preferred value. Below is an explanation of each value.

**Dam Design:** Dams are designed according to your state standards. Depending on the freeboard requirements for your state, you may see up to three design options.

**Dam Slopes:** The default value for the slope ratio is set by the state. If you enter a value that exceeds a state minimum slope, a warning message will appear in the Create Basin dialog box.

**Dam Settlement:** The minimum fill settlement and default value is 5%.

**Core Trench:** Click **Include a core trench** if a core trench is required for the basin. The trench will be planned according to your state requirements.

**Curve Number:** If you used BasinBuilder to calculate the Runoff Curve Number the first box will be selected using the program value. If you entered your own Runoff Curve Number, the second box "Use my own value" will be selected with the value you entered.

**Avg. Watershed Slope:** BasinBuilder calculates the average slope using the ArcGIS slope tool, rather than using soil maps.

**Erosion Rate:** The default value is 5 tons per acre. 100% of the gross sheet erosion is delivered to the basin.

**Dam Top Width:** BasinBuilder automatically calculates a dam top width based on NRCS dam standards. If desired, a wider dam top width may be entered. If state standards call for a wider top width than what you entered, your entered value will be ignored.

Once all desired values have been selected, click on **Create Basin!** at the bottom of window.

The screenshot shows the 'Create Basin' dialog box with the following settings:

- New Tile:** Slope: 2 % Length: 200 feet
- Existing Tile:** Does the unprotected area have existing tile?  Yes  No
- Type:** [Dropdown menu]
- Slope:** [Input field] % **Size:** [Input field] in.
- Dam Design:**  Standard Design  Standard Design + 1/2 Foot Spillway  Standard Design + 1 Foot Spillway
- Dam Slopes:** Front Slope: 3 : 1 (default 3: 1) Back Slope: 3 : 1 (default 3: 1)
- Dam Settlement:** 5 %
- Core Trench:**  Include a core trench
- Curve Number:**  Use the GIS value  Use my own value: 78
- Avg. Watershed Slope:**  Use the GIS value  Use my own value: [Input field] %
- Erosion Rate:**  Use the default value  Use my own value: [Input field] tons per acre per year
- Dam Top Width:**  Use the default value  Use my own value: [Input field] feet



## Using the Basin Selection Table

After a few moments the Basin Selection Table will appear as shown below. This table will list all possible scenarios of basins for this dam site. The table will give you the New Tile Size, Existing Tile Size, Pool Size, Dam Height, Runoff Stored, Drain Time, and Base Cost for each option.

Basin Selection							
New Tile Size	Existing Tile Size	Pool Size	Dam Height	Runoff Stored	Drain Time	Base Cost*	
in	in	ac	ft	%	hr	-	
5	6	1.89	9.2	83%	67.2	\$6,250	<a href="#">View 638</a>
6	6	1.83	9.0	78%	53.5	\$6,060	<a href="#">View 638</a>
	6	2.04	9.6	96%	114.0	\$6,550	<a href="#">View 638</a>
4	6	1.95	9.3	88%	82.4	\$6,410	<a href="#">View 638</a>
12	6	1.59	8.3	60%	15.5	\$5,810	<a href="#">View 638</a>
15	6	1.59	8.3	60%	10.6	\$6,740	<a href="#">View 638</a>
8	6	1.71	8.6	69%	33.2	\$5,710	<a href="#">View 638</a>
10	6	1.62	8.4	62%	23.3	\$5,700	<a href="#">View 638</a>
5		2.09	9.7	100%	163.8	\$7,090	<a href="#">View 638</a>
6		2.00	9.5	93%	100.7	\$6,790	<a href="#">View 638</a>
		2.09	9.7	100%	Unknown	\$6,750	<a href="#">View 638</a>
4		2.09	9.7	100%	297.0	\$7,010	<a href="#">View 638</a>
12		1.59	8.3	60%	18.0	\$5,810	<a href="#">View 638</a>
15		1.59	8.3	60%	11.7	\$6,740	<a href="#">View 638</a>
8		1.80	8.9	75%	46.8	\$6,050	<a href="#">View 638</a>
10		1.68	8.6	66%	29.2	\$5,900	<a href="#">View 638</a>

\* Base Cost includes Dam Fill and Tile costs. Inlets, Grubbing, Seeding, and Fencing costs will be added later in this estimate.

**Costs:** [ [Change](#) ] (These are the standard costs for Cass County, Iowa)

Dam Fill (per cubic yard): \$ 2.13      Seeding (per acre): \$ 348.77      Fencing (per foot): \$ 2.48  
 Grubbing (per acre): \$ 1,150.00      Inlet (per unit): \$ 235.00      Outlet (per foot): \$

Average base costs for dam fill and tiling have been provided by your county. These costs may be overridden if necessary at the bottom of the Basin Selection Table. Simply click **Change** located to the right of Costs: to enter your own values.

## Sorting and Narrowing your Results

Each column of the Basin Selection Table can be sorted from least to greatest, or greatest to least, by clicking on the heading of each column.

## Viewing a Basin

Once the desired basin is selected, you can display an aerial view of that basin. To create an aerial view of the basin, click on **View 638** in the right hand column of the table. A view of the basin will be displayed.

You can select another basin to view by returning to the Basin Selection Table. To return to the table, place the cursor on the green bar at the top of the basin view. When the cursor is placed on the green bar, a down arrow will appear. Click on the down arrow and you will return to the Basin Selection Table.

*The image you see on the screen will be the image printed in all the reports. Zoom to the desired level and turn on/off desired map layers before you click **Create Report.***

## Printing and Saving Reports

Several versions of reports are available to print and/or save. There are separate reports for both the landowner and the planner. The Planner's Report offers more comprehensive information than the Landowner's Report.

*Saving a report is the best way to document what was provided to the landowner.*

To create a report, click on the **Create Report** button.

Enter data into the Create Report dialog box (see left). Then, check the boxes of the reports you want to save and/or print and click on **Create Report!** at the bottom of the dialog box.

Choose whether you would like to open or save the file. (If the report is opened, it may still be saved after the report has been opened or printed.)

An Adobe Acrobat (PDF) report will be created. If both the Landowner Report and the Planner Report are selected, they will appear in one continuous PDF File. The Landowner Report will be on pages 1-4 and the Planner Report will be on pages 5-11. To print only one report, you will need to choose File, Print and indicate the page numbers you would like to print.

**Additional Report Details**

Preparer's name:

Preparer's phone:

Landowner's name:

Landowner's phone:

Grubbing Required: 0  ac @ \$  per ac

Seeding Required: 0  ac

Fencing Required: 0  ft @ \$  per ft

Inlets Required: 0  inlets Size: 6"

Outlet Required:  None  Length:  feet

**Select Report(s) To Download:**

Landowner Report [?](#)     Conservation Planner Report [?](#)

Warnings [?](#)     Planning Details [?](#)

Additional Info [?](#)     Technical Details [?](#)



The Landowner's Report can include:

- Disclaimer Statements
- Aerial View of Water and Sediment Control Basin
- Basic Basin Information and Estimated Cost

The Planner's Report can include:

- Disclaimer Statements
- Aerial View of Water and Sediment Control Basin
- Detailed Basin Information and Estimated Cost
- Water and Sediment Control Basin Planning Details
- Earthwork Dimensions
- Estimated Runoff Curve Number Worksheet
- Technical Calculations

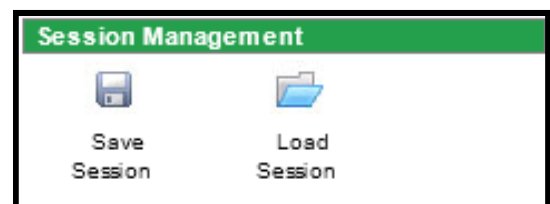
## Saving and Loading a Session

To save a session so you can return to it at a future point in time, choose the **Save Session** tool under Session Management menu option on the left hand side of the screen. Give the file a descriptive name and choose a location to save it. The session will be saved as a .sdt file.

All information will be saved except the final basin that you choose for your report. The Basin Selection Table will still be available. However, it is important that you save a copy of the basin report so you will be able to identify which basin you chose.

To load a previous session, simply choose the **Load Session** tool under Session Management menu option on the left hand side of the screen and navigate to the .sdt file you would like to load.

Loading a previous session allows you access to other basins from the Basin Selection table and allows you to alter values from the previous basin.



*Saving and Loading a session*

## Using the GIS Data Function

The GIS Data function allows information to be saved as an ArcGIS layer and a Microsoft Access file.

To save the GIS Data, click the **GIS Data** function under 638 Generation from the menu options on the left hand side of the screen. A zip file containing an ArcGIS layer file (.lyr) and a personal geodatabase file (.mdb) will be saved. The layer file and the personal geodatabase file can be added directly into ArcGIS. From ArcGIS, these layers can be downloaded an AutoCAD program or a GPS unit.



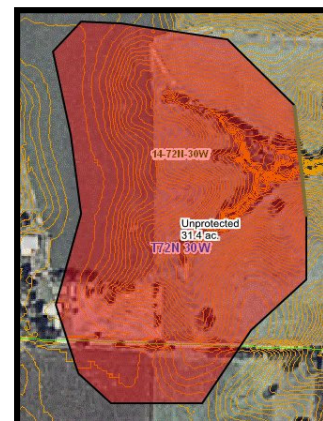
*Get GIS Data*

## Appendix A

### Basin Scenarios

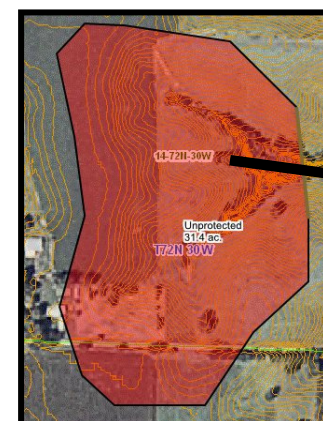
**Scenario #1:** The entire watershed above the proposed water and sediment control basin is unprotected (i.e. there are no other basins, terraces or ponds that retain part of the flow in the watershed above the proposed water and sediment control basin.)

Example 1a: There is no existing tile line in the watershed. *In this example, BasinBuilder will give options for a new tile line.*



Example 1a

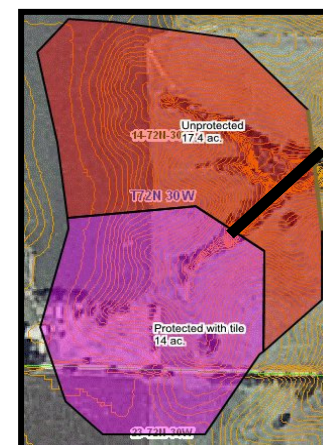
Example 1b: There is an existing tile line in the watershed, but the existing tile line outlets downstream from the proposed water and sediment control basin. *In this example, BasinBuilder will give options using the existing tile line and options for using the existing tile line, a new tile line, or a combination of new and existing tile lines.*



Example 1b

**Scenario #2:** The watershed is divided into a protected area(s) with tile and an unprotected area.

Example 2a: There is one protected area within the watershed. The existing tile line from the protected area outlets downstream from the proposed water and sediment control basin. In this example, BasinBuilder will give options for using the existing tile line only, new tile line only, as well as options for using both the existing tile line and a new tile line.



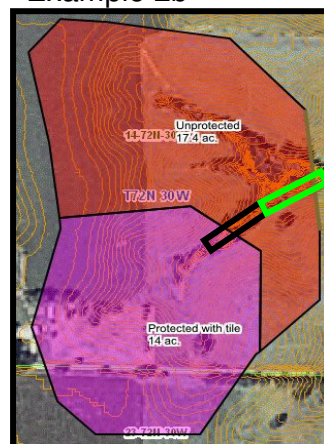
Example 2a

Example 2b: There are two protected areas within the watershed that are not adjoining. The existing tile lines from the two protected areas combine together in one single tile line, and that tile line outlets downstream from the proposed water and sediment control basin. In this example, BasinBuilder will give options for using the existing tile line only, new tile line only, as well as options for using both the existing tile line and a new tile line.



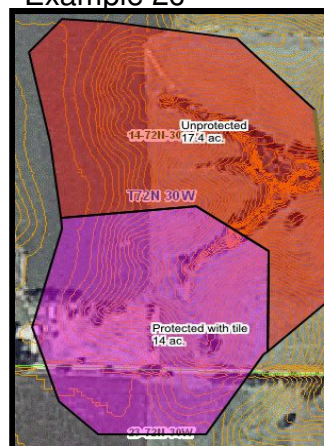
Example 2b

Example 2c: There is one protected area within the watershed. The existing tile line from this protected area outlets below the protected area, but still upstream from the proposed water and sediment control basin. In this example, BasinBuilder will give options on the size of tile line necessary to hook into the existing tile and drain both the protected and unprotected area.



Example 2c

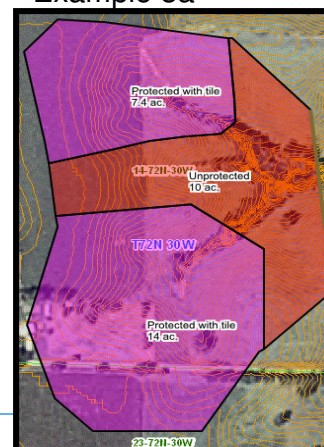
**Scenario #3:** The watershed is split into a protected area and an unprotected area. The protected area has no outlet. (i.e., the protected area has level terraces and all of the water infiltrates into the ground).



Example 3a

Example 3a: There is only one protected area. This protected area has no outlet.

Example 3b: There are multiple protected areas. None of the protected areas have outlets.



Example 3b



1238 Heires Ave. • Carroll, IA 51401  
P: 712.792.6248 • E: support@agrentools.com  
W: www.agreninc.com • www.agrentools.com