

AGREN[®]



WetlandBuilder

User Manual

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WetlandBuilder Introduction

WetlandBuilder will step you through the simple process of drawing a dam, watershed, flowline, and calculating a runoff curve number. If you don't want to calculate a runoff curve number, you will have the option of entering your own runoff curve number in WetlandBuilder.

With WetlandBuilder you will create a dynamic spreadsheet that offers a range of wetland options – and at a glance, you can see a variety of dam heights, pool depths, spillway types and base costs for each. Options can be sorted and filtered. Every report contains a complete cost estimate using county derived costs with an aerial photo showing the wetland dam and pool depths graphically.

Wetland plans calculations are based on 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 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.)

Email addresses cannot contain spaces or underscores.

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. If a user's activation link has expired, you can 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 user name (typically your email address) and password.

For subsequent logins, go to www.agrentools.com. Click on **Login** 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 address) 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.

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

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.

WetlandBuilder is compatible with all modern desktop browsers.

To contact support, email support@agrentools.com or call (844) 653-2528. Please include a copy of your saved session as well as a screen shot showing the problem you are experiencing. An email link can also be found by clicking ***Customer Support*** under the ***Welcome*** drop down in the top right corner of your browser. Please be as descriptive as possible in explaining the problem you are experiencing.

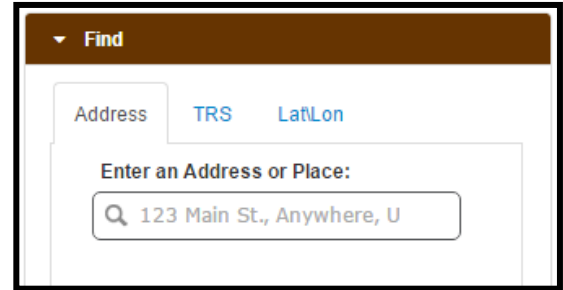
A User Manual and Demonstration Videos can be found at www.agrentools.com.

Zooming to Wetland Location

The location of the proposed wetland is the first information that is requested. Zoom in far enough that you can easily distinguish the contour lines but still see the entire wetland watershed on the screen.

Find Toolbar

The Find Toolbar provides tabs to search by either address; state, section, township, and range; or latitude and longitude. Click on a tab to select your preferred method to locate the property.



The Find toolbar provides three methods to locate the desired property.

Address:

Enter a street address or simply a city and state. As you type, a drop-down suggestion list will be populated. Click on the appropriate list item to choose your desired location.

TRS:

Enter a state, section, township, and range and press **Enter**.

Lat/Lon:

Enter the latitude and longitude of the location in decimal degrees and press **Enter**. To access a calculator to convert degrees minutes seconds to decimal degrees, visit <https://www.fcc.gov/media/radio/dms-decimal>.

Alternative Methods to Zoom or Pan

1. Press **Shift** on the keyboard and then 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. Double click in the map area to zoom in.
4. Click the **+ or -** in the top left corner of the map to zoom in and out.
5. Press the **+ or -** on the keyboard of your computer.
6. Click and drag the map to pan to the desired location.

Basemap Options

In the top right-hand corner of your map, there are three check boxes that allow different viewing options (shown on the right). Check the box next to the ArcGIS Basemap layer you prefer to work with.

Streets provides street map with highway-level and street-level data.

Imagery provides one meter or better satellite and aerial imagery.

Topo includes cities, water features, physiographic features, parks, landmarks, highways, roads, railways, airports, and administrative boundaries overlaid on land cover and shaded relief imagery for added context.



Basemap Options

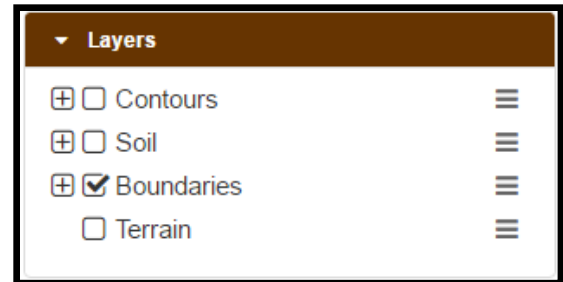
Map Layer Options

In the bottom left hand corner of your screen, you will find the Layers toolbar that allows different viewing options (shown on the right). Layers provide options to view two-foot Contours, Soils, Boundaries (Sections, Townships, Counties, and States) and Terrain (black and white image of the elevation).

Check the box next to the map layer(s) you prefer to work with when using this tool.

Different layers are available at different map scales. As you zoom in or zoom out, map layer options will become grey if they are not available.

You may use a combination of Contours, Soils, Boundaries, and Terrain layers simultaneously. Note: Contours in the Layers toolbar are only available for Iowa, Minnesota, Ohio, Nebraska, and Indiana.

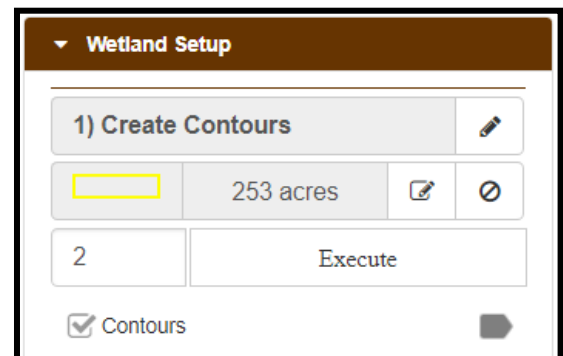


Map Layer Options

Create Contours

The first step in creating a wetland is to create contours. Begin by clicking the **Draw AOI** icon. On your map, left-click and drag to select the area in which you wish to create contours.

To edit the area of interest, click the **Edit AOI** icon. Click and drag any vertices to edit the AOI and click the **Save AOI** icon. To delete a vertex from the AOI, right-click the vertex and select **Delete** and click **Save AOI**.



Alternately, you can click the **Clear AOI** icon to completely delete the AOI. Then, click the **Draw AOI** icon again to choose a new area of interest.

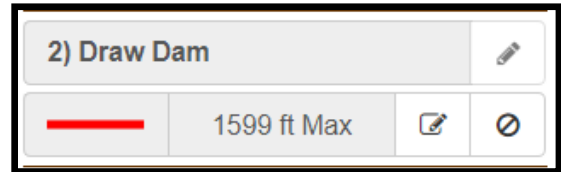
The default contour width is set at 2 feet, but you may change the contour width to any whole number. After entering your preferred contour width, click **Execute**. After a short period of time, the contour lines will process and appear on your map.

To turn on and off the contour layer, click the Contours check box. To turn on and off the contour labels, click the label icon.

Draw Dam

Determine where you want the dam and select the **Draw Dam** icon under the Wetland Setup toolbar.

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. The length of your dam will be displayed to the left of the Edit Dam icon.



Draw Dam Options

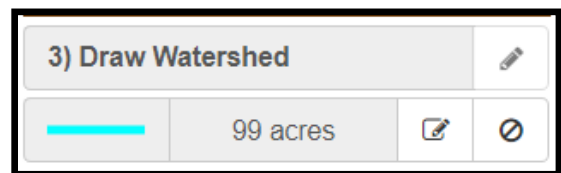
A dam with a curve in it can be made by clicking once on any number of points between the beginning and end of the dam. As above, double-click to complete the dam.

To edit the dam, click the **Edit Dam** icon. Click and drag any vertices to edit the dam and click **Save Dam**. To delete a vertex from the dam, right-click the vertex and select **Delete** and click **Save Dam**. If the vertices are too close together to delete, zoom in and they will begin to separate.

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

Draw 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 pan, use the + or – in the top left corner of the map, arrow keys on your keyboard, or the scroll bar on your mouse to zoom.



Draw Watershed Options

Click the **Draw Watershed** icon. Start drawing at one end of the dam and draw the outline of the watershed.

As you follow the boundary of the watershed, click every time you change direction. When you have a polygon drawn around your watershed, double click near the opposite end of the dam to end the watershed drawing process. The area of your watershed will be displayed to the left of the Edit Watershed icon.

To edit the watershed, click the **Edit Watershed** icon. Click and drag any vertices to edit the watershed. When finished, click the **Save Watershed** icon. To delete a vertex from the watershed, right-click the vertex and select **Delete**. If the vertices are too close together to delete, zoom in and they will begin to separate.

If the watershed is not where you want it, click the **Clear Watershed** icon and start over.

Draw Flowlines

A flowline is the distance water travels as a raindrop from site of impact to the dam. Flowlines are used to determine the longest flow path of water, or the greatest distance that water flows, from the top of the watershed to the dam. The distance is used in the time of concentration calculations.



Draw Flowlines Options

The flowline should follow the longest flow path of water from the top of the watershed down to the dam. If you are uncertain of the longest flow line, you can draw as many flow lines as you want. The shortest flowline will be automatically disappear.

Click on the **Draw Flowline** icon. Click once outside the top of the watershed and follow the flow of the water downhill, clicking every time you change direction. This is made easier by viewing the contour layer. End the flow path by double clicking just past the dam line. The length of your flowline will be displayed to the left of the Edit Flowline icon.

Any part of the flowline that is outside the watershed, or below the dam line will be removed automatically.

To edit the flowline, click the **Edit Flowline** icon. Click and drag any vertices to edit the flowline. To delete a vertex from the flowline, right-click the vertex and select **Delete**. If the vertices are too close together to delete, zoom in and they will begin to separate.

If the flowline is not where you want it, click the **Clear Flowline** icon and start over.

Define Runoff Curve Number (RCN)

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

To manually enter a runoff curve number, click **Yes** and enter your Runoff Curve Number Value and then skip to Generate Wetland.

To allow WetlandBuilder to calculate your runoff curve number, click **No** and follow the instructions below to assign hydrologic soil groups, cut land use, and assign land use.

Assigning Hydrologic Soil Groups

After clicking No to *Do you know the RCN?*, WetlandBuilder will retrieve the hydrologic data for the watershed.

Soil polygons can be assigned dual hydrologic groups and are indicated by the clear soil polygons on the maps. Dual hydrologic groups include A/D, B/D, or C/D. Choose the first letter if the soil has been adequately drained. Choose the second letter if the soil remains in the undrained condition. Some areas could have letters A, B, C, and D. Those areas can be existing water bodies, old farmsteads, construction sites, etc. The choice of the assignment is up to you.

To bulk assign all dual hydrologic groups, click the letter you choose to define the entire group and then click **Apply**.

To manually assign polygons, click **Manually Define Individual Groups**. Then, left click on each of the unassigned polygons and choose the hydrologic group that best represents that polygon.

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

To change a previously assigned polygon, left click on the polygon and select the appropriate Hydrologic Soil Group.

Cutting and Assigning Land Use

Differentiate land use types in the watershed by clicking the **Cut Land Use** icon.

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

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

If you make a mistake while cutting the land use, you may click the **Undo Last Cut** icon to undo your last land use cut.

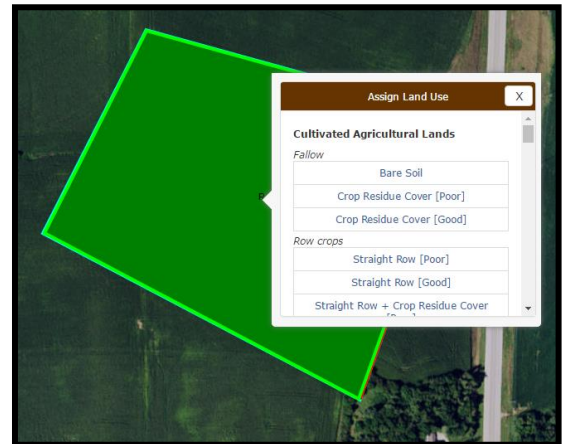
Click on the **Assign Land Use** icon. Each region in your watershed must be assigned a land use description (cover type, treatment and hydrologic condition).

To assign a land use, hold the mouse arrow over a polygon. Left click once on the polygon and a menu of descriptions will be displayed. Select the most appropriate land use for that polygon.

Continue this process until all polygons are labeled.

Calculate RCN

After you have assigned the hydrologic soil groups, cut and assigned the land use, click **Calculate RCN**. If you agree with the calculation, click **Apply**. To delete your RCN work and start again, click **No** to Do you know the RCN? and repeat the previous steps.



A variety of land use options are available for Cultivated Agricultural Lands, Non-Cultivated Agricultural Lands, as well as Urban Areas.

Generate Wetland

You are now ready to generate your wetland. Click on the **Generate Wetland** icon to the left of your map.

Set Design Criteria ✕

Select one wetland type from the list below to design.

Wetland Types:	
Ditch Plug	<input type="radio"/>
Vegetative/Straight Pipe	<input checked="" type="radio"/>

Next >

Select the type of wetland you choose to design and click **Next**.

On the following screen, Runoff Curve Number and Average Watershed Slope will be automatically calculated by WetlandBuilder. All other values displayed will default to the standard for the state you are working in. Any Design Value may be overridden by entering a number in the Custom Value column. Click **Next** at the bottom of window when finished.

Set Design Criteria
✕

Use the design value or enter a custom value.

Specify Design Standards:	Design Value	Custom Value
Runoff Curve Number	75	75
Average Watershed Slope	12.45%	12.45 %
Dam Top Width	TBD	TBD
Dam Front Slope Ratio	3:1	3 :1
Dam Back Slope Ratio	3:1	3 :1
Added Settlement	5%	5 %
Freeboard Height	1 ft	2 ft
Principal Spillway Storm Event	TBD	TBD ▾
Auxiliary Spillway Storm Event	TBD	TBD ▾
Minimum Years of Sediment Storage	0 yrs	0 yrs
Average Watershed Erosion	5 t/aly	6 t/aly
Delivery Rate of Erosion	70%	70 %
Sediment Delivery to Permanent Pool	80%	80 %
Sediment Delivery to Temporary Pool	20%	20 %

Next >

For Vegetative/Straight Pipe wetlands, select the principal spillway pipe types and auxiliary spillway widths that you want to be included in your results and click **Finish**. You must select a minimum of one pipe type and spillway width.

Set Design Criteria
✕

Select items from the lists below to be included in the results.

Specify Principal Spillway Pipe Types:	Specify Auxiliary Spillway Widths:
ACMP (Annular Corregated) <input type="checkbox"/>	10 ft wide <input checked="" type="checkbox"/>
HCMP (Helical Corregated) <input type="checkbox"/>	20 ft wide <input type="checkbox"/>
HDPE (High-density Polyethylene Pipe) <input type="checkbox"/>	Other <input type="text"/> ft
PVC (Polyvinal Chloride Pipe) <input type="checkbox"/>	Other <input type="text"/> ft
SSP (Smooth Steel Pipe) <input type="checkbox"/>	
Vegetative <input type="checkbox"/>	

← Back
Finish

Using the Wetland Selection Table

After a few moments, the Wetland Selection table will appear. This table will list all possible scenarios of wetlands for this dam site. The default table for Vegetative/Straight Pipe wetlands will give you the Base Cost, Permanent Pool Surface Area, Maximum Pool Depth, Settled Fill Height at Centerline, Settled Fill Height from Backtoe, Drainage to Pool Surface Area Ratio, Pipe Diameter, Pipe Type, Principal Spillway Type, and Depth of Fill Over Pipe for all wetland options. By clicking + in the top right-hand corner of the table, you will find additional values that you can add to your view.

The default table for Ditch Plug wetlands will give you Base Cost, Permanent Pool Surface Area, Maximum Pool Depth, Settled Fill Height at Centerline, Settled Fill Height from Backtoe, Drainage to Pool Surface Area Ratio. By clicking + in the top right-hand corner of the table, you will find additional values that you can add to your view.

Choose a wetland by clicking any row below.

Click on column header to sort the column. Click on filter icon to narrow results.

Base Cost (\$)	Permanent Pool Surface Area (ac)	Maximum Pool Depth (ft)	Settled Fill Height at Centerline (ft)	Settled Fill Height from Backtoe (ft)	Drainage to Pool Surface Area (ratio)	Pipe Diameter (in)	Pipe Type	Principal Ty
\$10,889.77	11.35	3	7.07	7.15	17.1	30	ACMP	Straight
\$11,203.18	11.35	3	7.17	7.25	17.1	18	ACMP	Straight
\$11,562.77	11.35	3	7.27	7.35	17.1	15	ACMP	Straight
\$11,223.78	11.35	3	7.17	7.25	17.1	21	ACMP	Straight
\$11,236.78	11.35	3	7.17	7.25	17.1	24	ACMP	Straight
\$11,950.01	18.21	3.5	7.37	7.45	12.1	18	ACMP	Straight
\$12,320.92	18.21	3.5	7.47	7.55	12.1	15	ACMP	Straight
\$11,967.86	18.21	3.5	7.37	7.45	12.1	21	ACMP	Straight
\$11,983.61	18.21	3.5	7.37	7.45	12.1	24	ACMP	Straight
\$13,122.65	24.56	4	7.67	7.75	10.1	18	ACMP	Straight
\$13,112.45	24.56	4	7.67	7.75	10.1	15	ACMP	Straight
\$13,143.25	24.56	4	7.67	7.75	10.1	24	ACMP	Straight

Limit options to least cost for each 1/2 foot elevation.

Modifying Costs

Average base costs have been set for earth work and pipe. These costs may be overridden if necessary by click **Modify Default Costs** in the bottom left of the Wetland Selection table. Simply enter your custom cost(s) in the Custom Cost column and click **OK**.

Modify Default Costs

Use the default cost or enter a custom cost.

Earth Work

Specify Costs:	Default Cost	Custom Cost
Constructed Fill	\$1.89 cu yd	\$ <input type="text"/>

Pipe

	Specify Costs:	Default Cost	Custom Cost
ACMP	12 in	\$1.89	\$ <input type="text"/>
HCMP	15 in	\$2.20	\$ <input type="text"/>
HDPE	18 in	\$2.40	\$ <input type="text"/>
SSP	21 in	\$2.75	\$ <input type="text"/>
PVC	24 in	\$3.00	\$ <input type="text"/>
	30 in	\$3.25	\$ <input type="text"/>
	36 in	\$3.50	\$ <input type="text"/>

Ok Cancel

Export to WinPond

WetlandBuilder allows you to export your chosen Vegetative/Straight Pipe wetland to make additional custom design modifications in WinPond. Simply click **Export to WinPond** in the lower right of the table to download a .prj file that can be uploaded to WinPond.

Sorting and Filtering your Results

The Wetland Selection table can be sorted in many ways. You can sort each column least to greatest or greatest to least, by clicking on the heading of each column.

The wetland results also can be filtered by clicking the funnel icon at the top right of any column. You may also choose to show only the least expensive wetlands for each pool height. To do this, click **Limit options to least cost for each ½ foot elevation** at the bottom of the table.

Click **Reset All Filters** to return to the original unfiltered table.

Viewing a Wetland

Once the desired wetland is selected, you can display an aerial view of that wetland on your screen. To create an aerial view, click on the chosen line and click **Display on Map** at the bottom right of the table. A view of the wetland and flow path will be displayed. To view another wetland, select the appropriate line on the table and click Display on Map again.

Creating a Report

To create a report, first select the wetland you prefer and turn on the desired map layers that you want to appear in the report. Then, click **Create Report** in the bottom right of the table.

In the following window, you may enter values to include a berm or foundation cutoff. Enter zeros if you do not desire a berm or foundation cutoff. When finished, click **Next**.

Create Report
✕

Use the berm design value or enter a custom value

Specify Design Standards:	Design Value	Custom Value
Berm Top Width	8 ft	<input type="text" value="8 ft"/>
Berm Side Slope Ratio	3:1	<input type="text" value="3:1"/>

Use the foundation cutoff (core trench) design value or enter a custom value

Specify Design Standards:	Design Value	Custom Value
Foundation Cutoff Bottom Width	10 ft	<input type="text" value="10 ft"/>
Foundation Cutoff Depth	4 ft	<input type="text" value="4 ft"/>
Foundation Cutoff Side Slope Ratio	1.5:1	<input type="text" value="1.5:1"/>

Use the default cost or enter a custom cost

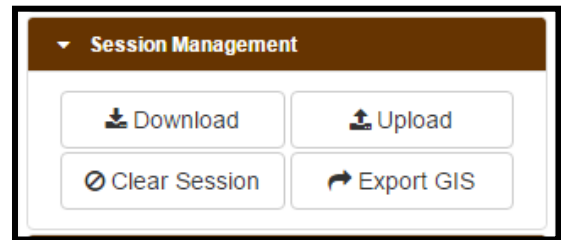
Specify Costs:	Default Cost	Custom Cost
Berm Fill	\$1.89 cu yd	<input type="text" value="\$"/>
Foundation Cutoff Fill	\$1.89 cu yd	<input type="text" value="\$"/>
Foundation Cutoff Excavation	\$2.50 cu yd	<input type="text" value="\$"/>

Enter data in for the client and preparer and choose whether you want the aerial image to zoom to the watershed or the wetland and click **Finish**. When the report is complete, click **Open PDF** to open the report in a new browser window. Choose whether you would like to print or save the file.

Pages 1-2 are designed to be given to the landowner. The remaining pages contain detailed wetland information for the conservation planner.

Saving and Loading a Session

To save a session so you can return to it in the future, click **Download** under the Session Management toolbar on the left-hand side of the screen. Give the file a descriptive name and choose a location to save it.



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

To load a previous session, simply choose the **Upload** icon under the Session Management toolbar and navigate to the file you would like to load.

Loading a previous session allows you access to other wetlands from the Wetland Selection table and allows you to alter values from the previous wetland.

Export GIS Data

The Export GIS icon allows information to be saved in multiple file types including .cpg, .dbf, .prj, .sbn, .sbx, .shp, and .shx. Layers are exported for flowline, landuse, pool, soil hydrology, structure, and watershed.

To save the GIS Data, click **Export GIS** under the Session Management toolbar on the left-hand side of the screen. A zip file containing multiple file types will be saved.

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