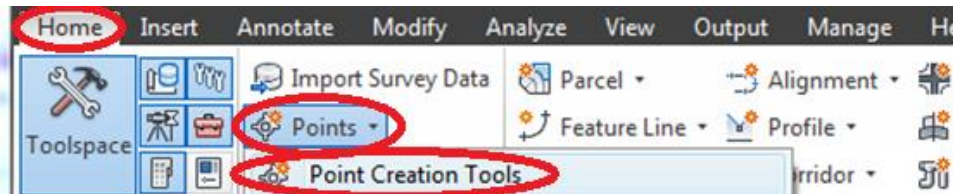


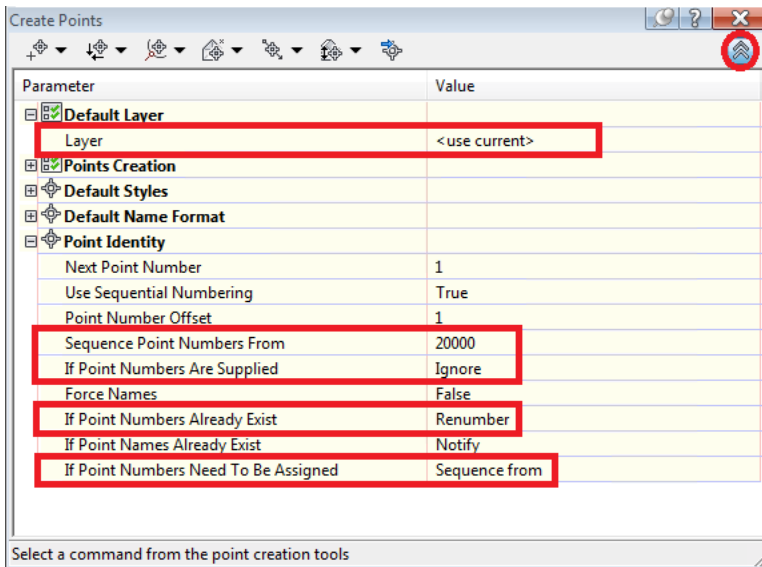
Standards and Processes for Delineation Information in AutoCAD C3D

1. Prior to opening AutoCAD Civil 3D, update your C3D templates. If needed, directions can be found on the [RETTEW CADD Community intranet page](#) in the link “Instructions on Updating your Standards Folder” currently found under “CADD News”.
2. Once templates are updated, open AutoCAD Civil 3D. Create a new DWG file based on the RETTEW-SV.dwt or the RETTEW-NS.dwt or open the existing SV-BASE drawing. These templates contain various NS styles that will be used in this process. If you need to begin the file with another template or do not have the styles in the existing drawing, you will later need to add the styles from either of these templates.
3. Complete any preliminary CADD work that is necessary. As part of this, set or check that the file is set to the proper coordinate system.
4. Whenever ready to begin adding GPS data, create a layer for the date of the wetland GPS data. The layer name should be V-NODE-WETL-YYYY-MMDD, where YYYY-MMDD is the year, month, and date of the fieldwork. You can rename the existing V-NODE-WETL layer. Also, add additional layers for additional days of fieldwork when needed. This allows for easier to freezing/thawing of certain days due to re-delineations, reroutes, etc. When created, make this layer current.
5. Click on the Home ribbon, then Points under Create Ground Data, and lastly Point Creation Tools.

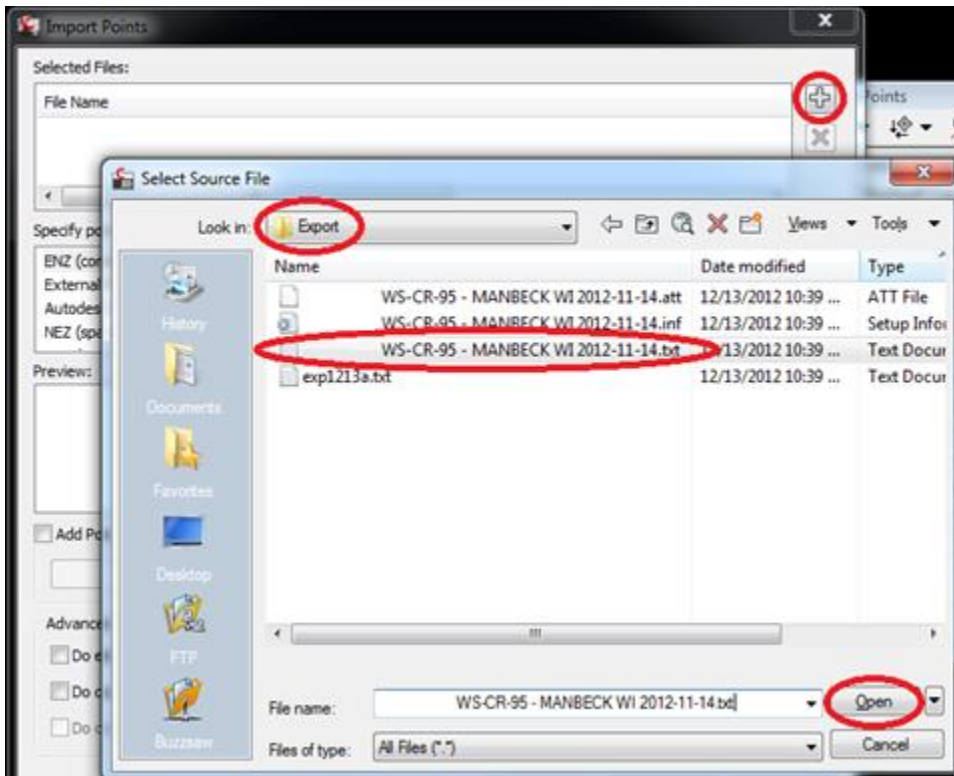


6. In the Create Points toolbar, expand the dialog box (the icon circled in red), expand the parameters shown below, and edit the fields as indicated in red. These settings will ensure that the points are imported in the standard point number range and that no other points in the drawing will be overwritten. When set, click the Import Points icon (the icon circled in blue), and

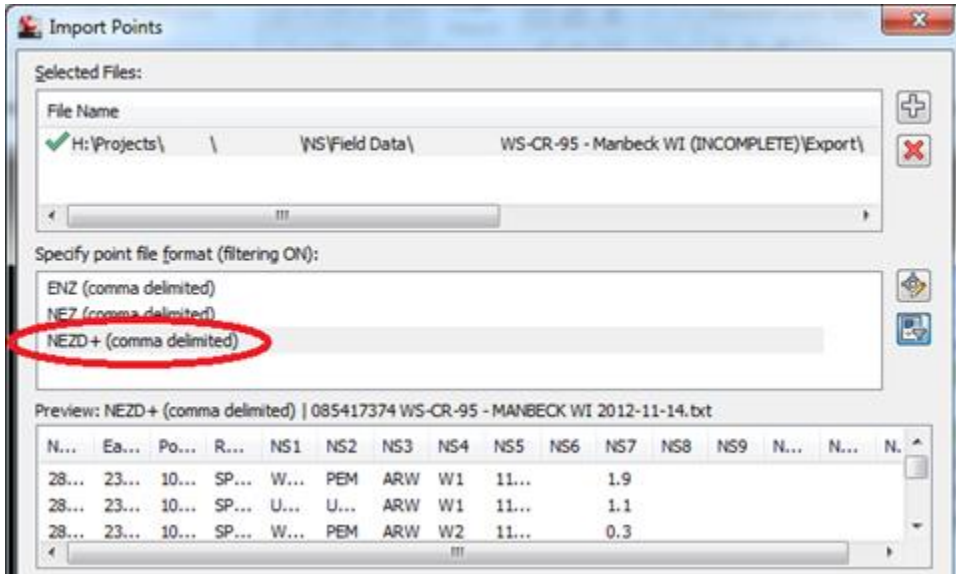
the Import Points dialog box will open.



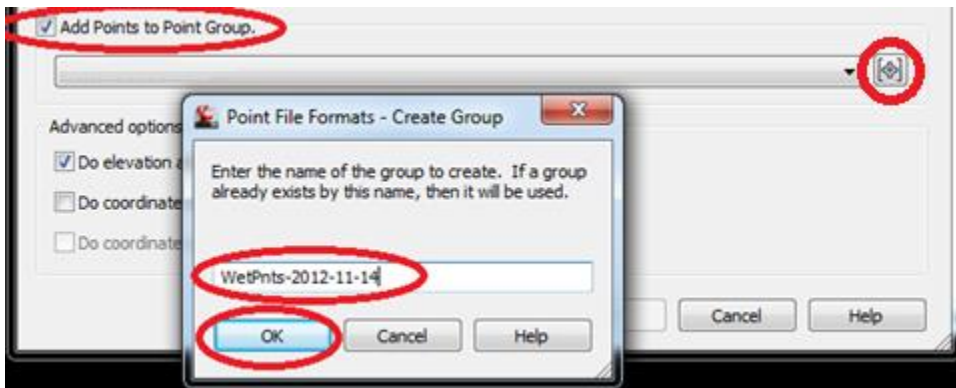
7. In the Import Points dialog box, click the Add Files icon and navigate to the Export folder that was created by GPS Pathfinder Office and moved onto the network. Select the TXT file that was created and click Open.



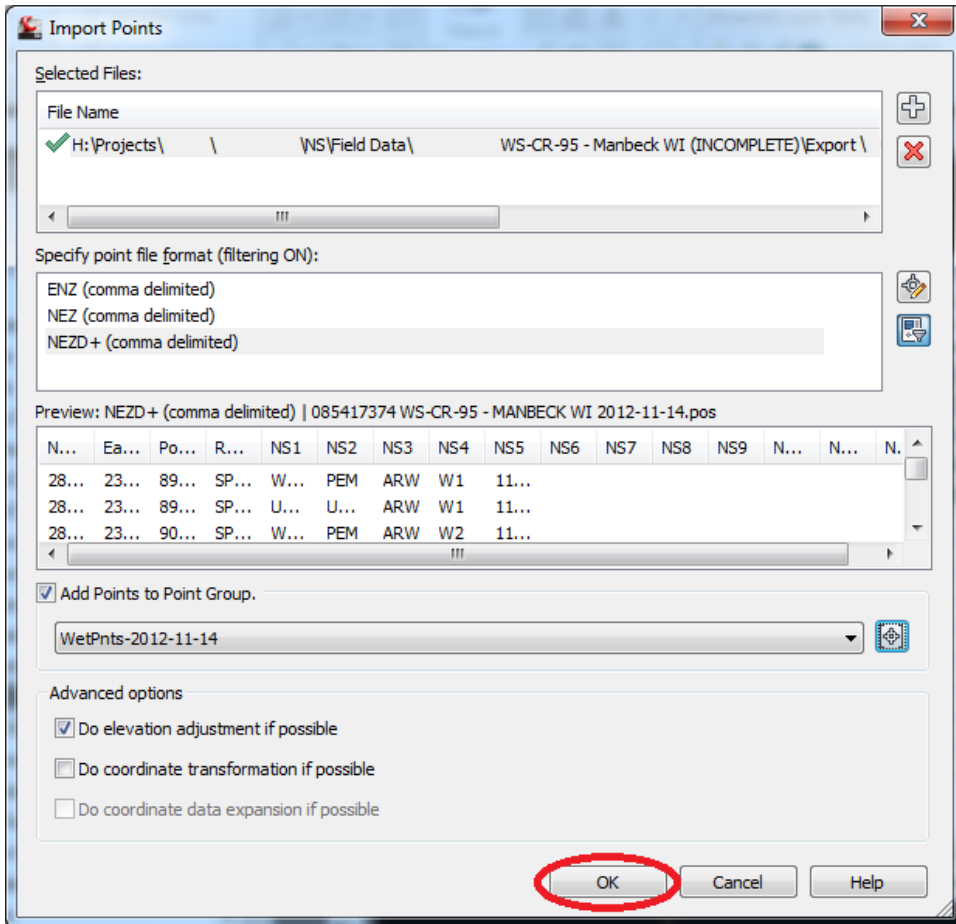
- In the Import Points dialog box, set the point file format to NEZD+ (comma delimited).



- Check Add Points to Point Group and click the icon to the right of the pull-down menu. In the Point File Formats – Create Group dialog box, name the point group “WetPnts-YYYY-MM-DD”, where YYYY-MM-DD is the year, month, and date of the fieldwork. Click OK to close the Point File Formats – Create Group dialog box.

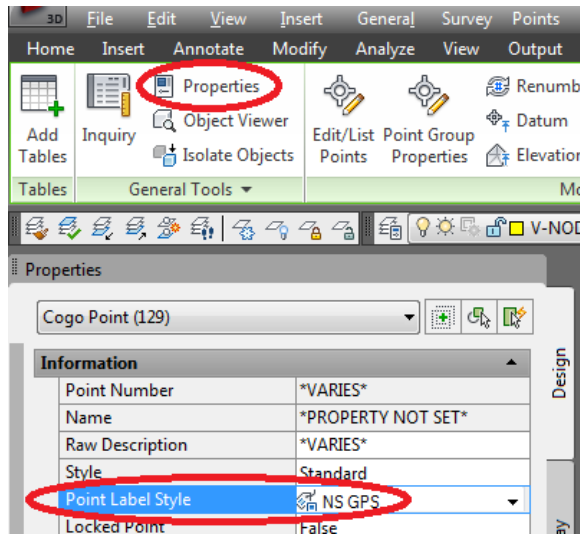


10. In the Import Points dialog box, ensure that the above settings are correct, accept the default for Advanced Options, and click OK.



11. Close the Create Points toolbar.
12. The points will be inserted with the "Survey Point" Point Label Style if the drawing was started with the RETTEW-SV template. The Point Label Style "NS GPS" will display all of the attributes that the field crew collected at each point (if the drawing was started with the RETTEW-NS template, the points will be inserted with the "NS GPS" Point Label Style). To display this Point Label Style, locate and select all of the points (TIP: Select one point, right click, and click Select Similar). Open Properties and revise the Point Label Style to "NS GPS". Use the escape key to

deselect the points.



13. The “NS GPS” Point Label Style contains several attributes, and depending on the proximity of the points and the annotation scale of the drawing, these attributes may not be clearly visible. It is advised to temporarily reduce the annotation scale to draw linework, and then increase the annotation scale when labeling. Another option is to change the Point Label Style to “Description” to only view the first attribute, which is commonly the flag label. This may suffice for initially drawing linework; however, it will not display other pertinent information (for example, wetland classifications, stream types, and culvert material/size).
14. The attributes that are displayed at each point can depend on the type of GPS point selected by the field crew. The second to last attribute should show the type of point the field crew selected. Below is each type of GPS point available and their various attributes. If any other attribute is not filled in by the field crew, it will not display in CADD (meaning one wetland GPS point may have 6 attributes, and another wetland GPS point may have 4 attributes). Commonly, these attributes are also shared by the GIS service area.

Wetland (Draw wetlands in SV-BASE)	Streams (Draw streams in SV-BASE)
Abc ID	Abc Stream ID
- Type	- Type
Abc Initials	- Feature Type
Abc Corresponding SP (Corresponding Sample Point)	- Riparian Buffer
Abc Comment	Abc Initials
Date	Abc Comments
Abc Type of GPS Point	Date
123 Accuracy (Estimated Accuracy of GPS Point (feet))	Abc Type of GPS Point
	123 Accuracy (Estimated Accuracy of GPS Point (feet))

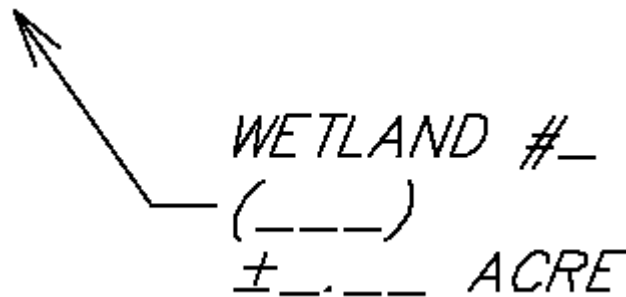
<p><u>PCDF/Post-Construction Drainage Feature</u> (Draw PCDFs in SV-BASE; Similar to wetlands)</p> <p>Abe ID <input type="checkbox"/> Type Abe Initials Abe Corresponding SP (Corresponding Sample Point) Abe Comment <input type="checkbox"/> Date</p>	<p><u>Sample Points</u> (Do not draw sample points in SV-BASE. Sample points are drawn in delineation plans when needed.)</p> <p>Abe ID <input type="checkbox"/> SP Type <input type="checkbox"/> SP Wetland Type <input type="checkbox"/> SP Upland Type Abe Initials Abe Comment <input type="checkbox"/> Date Abe Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet))</p>
<p><u>Centerline</u> (This usually indicates a proposed alignment that is followed. Only draw in SV-BASE if this point was used to locate an existing feature.)</p> <p><input type="checkbox"/> Type Abe Misc Abe Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet))</p>	<p><u>Well Pad</u> (This could be locating an existing or proposed feature. Only draw in SV-BASE if this point was used to locate an existing feature.)</p> <p>Abe Name Abe Misc Abe Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet))</p>
<p><u>Impoundment</u> (This could be locating existing or proposed. Only draw in SV-BASE if this point was used to locate an existing feature.)</p> <p>Abe Name Abe Misc Abe Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet))</p>	<p><u>Reference Points</u> (This could be locating an existing or proposed feature. Only draw in SV-BASE if this point was used to locate an existing feature.)</p> <p>Abe Comment Abe Misc Abe Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet))</p>
<p><u>Culvert</u> (Draw culverts in SV-BASE)</p> <p>Abe ID <input type="checkbox"/> Pipe Material 123 Diameter/Width (Diameter/Width (in Inches)) 123 Pipe Height (Height if different from width (Inches)) <input type="checkbox"/> End <input type="checkbox"/> Jurisdictional? Abe Misc Abe Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet))</p>	<p><u>Springs</u> (Draw springs in SV-BASE)</p> <p>Abe ID Abe Misc Abe Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet))</p>

<p><u>Road Bore-Bury (Bores-Buries)</u> (This could be locating an existing or proposed feature. Only draw in SV-BASE if this point was used to locate an existing feature.)</p> <ul style="list-style-type: none"> -☐ Type -☐ Feature Type -☐ Feature Crossing Abc Comment Abc Road Name Abc Stream Name/Number Abc Wetland Name/Number Abc Associated Waterline Abc Depth Abc Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet)) 	<p><u>AOI/Area of Investigation</u> (Draw area of investigation in SV-BASE)</p> <ul style="list-style-type: none"> -☐ Type Abc Miscellaneous Abc Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet))
<p><u>Photo Location</u> (Do not draw photo locations in SV-BASE. Photos are drawn in delineation plans when needed.)</p> <ul style="list-style-type: none"> Abc Photo Number -☐ Heading Abc Comments Abc Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet)) 	<p><u>I Bat Tree Survey</u> (Draw existing trees in the SV-BASE)</p> <ul style="list-style-type: none"> -☐ Size-Diameter -☐ Condition (Cavity Prevalence) Abc Species Abc Comment Abc Surveyor Initials (Initials) ☐ Date Abc Type of GPS Point 123 Accuracy (Estimated Accuracy of GPS Point (feet))

15. Draw wetlands, streams, and any other features that may have been collected by the field crew according to the standards below:

- V-WETL: layer color set to 86; WETLAND-LEFT linetype.
 - Draw wetland boundaries using polylines with the wetland symbols on the inside of the wetland. If the symbols happen to fall outside the wetland based on the direction of the polyline, simply use the REVERSE command to reverse the direction of the polyline.
 - Wetland flag labels can be numbered sequentially as W1-1..., W1-2, W1-3, etc. The first number of the flag indicates the wetland number, and the second number indicates the flag number. This method is often used when a single site visit is anticipated.
 - Wetland flag labels can also be numbered more extensively with the date, time, initials, and flag number (for example, W-141114-1015-DWS-3). This method is used when multiple delineators are on-site or multiple site visits are anticipated.
 - If a flag label contains “CONT”, the delineation stops, but the wetland continues outside of the area of investigation. In CADD, use a leader at the end of the boundary pointing in the direction it continues.
 - If a flag label contains “CLOSE”, the wetland boundary closes to the beginning of the wetland boundary (or possibly closes to a stream).

- V-WETL-PATT: layer color set to 253; CONTINUOUS linetype.
 - This layer contains hatch inside of the wetland boundaries. In addition to the linetype, hatch in the middle of the wetland clearly portrays what areas are wetlands.
 - The standard hatch pattern is “WET”, and the spacing of the pattern should be half of the drawing scale. If the scale is 1”=30’, spacing of the pattern should be 15; if the scale is 1”=50’, use 25; etc.
- V-WETL-TEXT: layer color set to 3; CONTINUOUS linetype.
 - Label the wetlands in the xbase using mleaders in the below format:



Where:

Wetland #_ - indicates the number of the wetland as determined by the biologists/environmental scientists. This is found in the flag label as described above.

(____) – indicates the classification of the wetland (PEM, PSS, PFO, etc. or any combination as indicated by the biologists). This is one of the attributes in the wetland GPS points. If this is not readily available, it can be passed.

±_.__ Acres – indicates the size of the wetland to two decimal places. If the wetland boundary is closed (meaning the entire wetland boundary is delineated), the wording in the example can be used. If the wetland continues in an area not delineated (meaning the entire wetland boundary is NOT delineated, or wetland boundary is open), this text should read “>_.__ Acres” based on the area that was delineated.

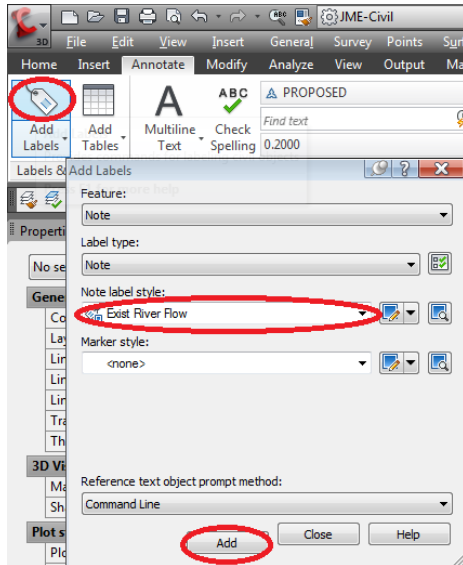
- If a wetland continues, add text that says “Wetland Continues” in the area where the wetland is open.
- V-RIVR: layer color set to 162; RIVER linetype.
 - This layer represents the edge of water or ordinary high water mark of any jurisdictional stream, spring, or water body.
 - Stream flag labels can be numbered sequentially as STR1-1..., STR1-2, STR1-3, etc. The first number of the flag indicates the stream number, and the second number indicates the flag number. This method is often used when a single site visit is anticipated.

- Stream flag labels can also be numbered more extensively with the date, time, initials, and flag number (for example, STR-141114-1030-DWS-2). This method is used when multiple delineators are on-site or multiple site visits are anticipated.
- Note what part of the stream the delineator located. It will be either “Centerline”, “OHWM”, or “Top of Bank” and can be found in the attribute in red below.

Str-1-2
 Perennial
 Centerline
 Herbacious
 ARW
 11/14/12

- If it is “Centerline”, connect the points with a polyline on the V-RIVR layer, offset to both sides to the width indicated in the field notes, and then erase the centerline.
- If it is “OHWM”, connect the points with a polyline on the V-RIVR layer.
- If it is “Top of Bank”, connect the points with a polyline on the V-RIVR-TOPB layer (see below).
- If a flag label contains “CONT”, the delineation stops, and but the stream continues outside of the area of investigation.
- If a flag label contains “START”, “BEGIN”, or “END”, the jurisdictional stream either begins or ends at that location.
- If a feature is not jurisdictional (e.g. certain swales), it is suggested to not show anything to represent it. However, if desired by the project manager or NS phase manager, the V-SITE-GRND layer can be used to represent the non-jurisdictional feature.
- If a stream is surveyed, do NOT alter the surveyed stream edge. This is more accurate than the GPS’d stream and should not be modified. If the delineation extends beyond a surveyed stream, then the stream can be “extended” using the GPS shots. However, a surveyed stream may be “trimmed” if the delineation identifies that the stream either begins or ends.
- V-RIVR-TOPB: Layer color set to 162; RIVER-TOP OF BANK linetype
 - This layer will represent the top of the bank of a stream channel.
 - This is required for many projects in Pennsylvania as part of PA DEP permitting requirements. However, it is often not necessary for projects outside of PA. Coordinate with the project manager or NS phase manager to determine the need.

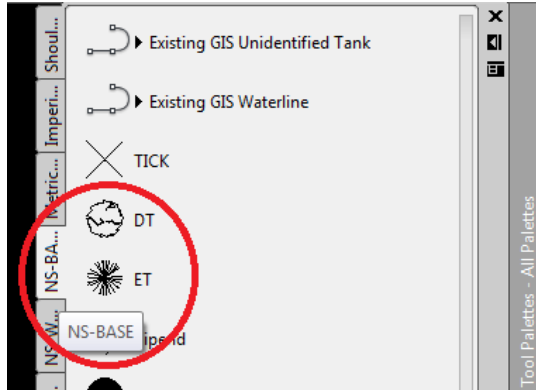
- This can be drawn in the same manner as described for V-RIVR above: either connect the “Top of Bank” stream points or offset the “Centerline” stream points to the width indicated in the field notes
- V-RIVR-TEXT: layer color set to 3; CONTINUOUS linetype.
 - Label the streams in the xbase using mleaders indicating “STREAM #_”. The stream number is found in the flag label as described above.
 - Where a stream continues, begins, or ends, add mtext that says “STREAM CONTINUES/BEGINS/ENDS” (as appropriate) in the proper locations.
 - Add a flow arrow for each stream. Click on the Annotate tab and click the Add Labels icon to open the Add Labels dialog box. Select Note in the Feature and Label Type pull-down menus. Select “Exist River Flow” under the Note Label Style pull-down menu, and select “<none>” under the Marker Style pull-down menu. Click Add to add the label in the drawing. The flow arrows can be moved as needed and rotated by hovering over the appropriate grips. However, do not use “move label” as the arrow will disappear (this is a current “bug” in AutoCAD).



It is also beneficial to change this label to the V-RIVR-TEXT layer (after selecting it, you may notice that it is on the 0 layer).

- V-STRM-PIPE: layer color set to 144; SMDASH linetype
 - Draw a line connecting the appropriate culvert inlet and outlet points. Then, offset to each side per the size indicated in the GPS point. Erase the centerline.
 - If the culvert was also located by survey methods, do not draw an additional culvert or modify the surveyed culvert. Simply use the surveyed culvert as it is more accurate.
- V-STRM-TEXT: layer color set to 144; CONTINUOUS linetype
 - Label the delineated culverts in the xbase using mleaders indicating the size and type.

- V-WETL-AOI: layer color set to 230; LONGDASH linetype.
 - This is a polyline that outlines the area of investigation for the delineation. It should encompass all areas that were delineated.
- V-SITE-VEGE: layer color set to 34;
 - Show any trees located during the delineation or bat tree survey. Revise the point style and layer to show a deciduous tree an evergreen tree, or insert either the DT or ET blocks. These blocks can be found in the NS-BASE Tool Palette.



- If the tree was also located by survey methods, do not draw an additional tree or modify the surveyed tree. Simply use the surveyed tree as it is more accurate.
 - V- SITE-VEGE -TEXT: layer color set to 3; CONTINUOUS linetype
 - Label the trees in the xbase using mleaders indicating the size and type.
 - Any other feature that was GPS'd by the field crew and not currently in the SV-BASE should be drawn on the appropriate layer. For example, an existing utility pole that was GPS'd by the field crew but not surveyed should be on V-UTIL-POLE.
 - Either revise the point style and layer of the point, or insert the appropriate block at that location.
16. Once complete, review the plan information with the field crew.